

EXHIBIT 13



Final

Record of Decision for Parcel UC-3

**Hunters Point Naval Shipyard
San Francisco, California**

January 2014

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San Francisco, California**

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Prepared for:



**Department of the Navy
Base Realignment and Closure
Program Management Office West
San Diego, California**



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Acronyms and Abbreviations

µg/L	microgram per liter
§	Section
ACM	asbestos-containing material
ARARs	applicable or relevant and appropriate requirements
ARIC	area requiring institutional controls
AST	aboveground storage tank
BERA	baseline ecological risk assessment
bgs	below ground surface
BRAC	Base Realignment and Closure
CCSF	City and County of San Francisco
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
CSM	conceptual site model
DTSC	Department of Toxic Substances Control
ERA	ecological risk assessment
FFA	Federal Facility Agreement
FS	feasibility study
FUDS	Formerly Utilized Defense Sites
GDGI	groundwater data gaps investigation
GWTS	groundwater treatability study
HHRA	human health risk assessment
HI	hazard index
HPAL	Hunters Point ambient level
HPNS	Hunters Point Naval Shipyard
HRA	Historical Radiological Assessment
HRC	hydrogen release compound
IAS	Initial Assessment Study
IC	institutional control
IR	Installation Restoration
ISB	in situ bioremediation

ACRONYMS AND ABBREVIATIONS

LUC RD	land use control remedial design
MCL	maximum contaminant level
mg/kg	milligram per kilogram
mg/L	milligram per liter
MNA	monitored natural attenuation
MOA	memorandum of agreement
msl	mean sea level
Navy	United States Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NRDL	Naval Radiological Defense Laboratory
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
RAO	remedial action objective
RACR	remedial action completion report
RD	remedial design
RG	remediation goal
RI	remedial investigation
RME	reasonable maximum exposure
RMP	risk management plan
ROD	record of decision
RWQCB	San Francisco Bay Regional Water Quality Control Board
SA	site assessment
SARA	Superfund Amendments and Reauthorization Act
SSF	site-specific factor
SVOC	semivolatile organic compound
SWAQAT	solid waste air quality assessment test
TCE	trichloroethene
TCRA	time-critical removal action
TPH	total petroleum hydrocarbons
Triple A	Triple A Machine Shop, Inc.
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
yd ³	cubic yard
ZVI	zero valent iron

1.0 Declaration

This Record of Decision (ROD) presents the selected remedy for Parcel UC-3 at Hunters Point Naval Shipyard (HPNS) San Francisco, California. HPNS was placed on the National Priorities List (NPL) in 1989 (United States Environmental Protection Agency [USEPA] Identification: CA 71170090087). The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 (Title 42 United States Code Section [§] 9601, et seq.); and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (Title 40 Code of Federal Regulations [CFR] Part 300). This decision is based on the Administrative Record file for this site¹. The Administrative Record index is included in the electronic version of this ROD as Attachment A. The United States Department of the Navy (Navy) and USEPA jointly selected the remedy for Parcel UC-3. The California Department of Toxic Substances Control (DTSC) and the San Francisco Bay Regional Water Quality Control Board (RWQCB) concur on the remedy for Parcel UC-3. The Navy provides funding for site cleanup at HPNS. The Federal Facility Agreement (FFA) for HPNS documents how the Navy intends to meet and implement CERCLA in partnership with USEPA, DTSC, and RWQCB.

Parcel UC-3 was formerly part of Parcel E. Parcel E is one of the six parcels (Parcels A through F) originally designated for environmental restoration. In February 2013, Parcel UC-3 was designated as a separate parcel for remedy selection to facilitate a real property conveyance strategy and schedule of Parcel UC-3². Environmental investigations began at Parcel E, including Parcel UC-3, in 1984. The Final Revised Parcel E Remedial Investigation (RI) Report was completed and submitted in 2008. The Final Parcel E Feasibility Study (FS) Report was completed and submitted in 2012. This ROD documents the final remedial action for Parcel UC-3 and does not include or affect any other sites at HPNS.

1.1 Selected Remedy

The CERCLA remedial action selected in this ROD is necessary to protect the public health, welfare, or the environment from actual or potential releases of hazardous substances from Parcel UC-3. This ROD identifies the selected remedy for Parcel UC-3 to address soil affected by semivolatile organic compounds (SVOCs), metals, radionuclides, and total petroleum hydrocarbons (TPH). This ROD also identifies the selected remedy for trichloroethene (TCE)-affected groundwater from Installation Restoration (IR) Site 56. The selected remedy consists of the following actions to address risks posed by contaminated media:

- Removal of contaminated soil from selected areas that contain high concentrations of SVOCs, metals, and TPH and dispose of contaminated soil offsite.

¹ **Blue text** identifies detailed site information available in the Administrative Record and listed in the References Table (Attachment B).

² Discussions within this ROD that reference documents published prior to February 2013 refer to the portion of Parcel E that became Parcel UC-3.

- Excavation of radiologically impacted sewer and storm drain lines and disposal of material associated with the excavation.
 - The excavation of radiologically impacted sewer and storm drain lines was completed at Parcel UC-3 under a Time- Critical Removal Action (TCRA) in 2011. The removal action included all sewer and storm drain lines within Parcel UC-3 as well as potentially impacted soil. A Radiological Removal Action Completion Report (RACR) for Parcel UC-3 was submitted on March 16, 2012, and received concurrence for radiological unrestricted release from DTSC on October 31, 2012. All work required by the selected radiological remedy (Alternative R-2) has been completed, and no additional actions are required. Selection of Alternative R-2 is documented in this ROD.
- Install a durable cover consisting of asphalt and concrete surfaces corresponding to Redevelopment Block MU-3 on the eastern portion of Parcel UC-3 to break the exposure pathway for contaminants left in place.
- Sample, clean, and close steam lines (IR Site 45), as needed, within Parcel UC-3.
- Groundwater treatment by injection of biological nutrients to break down VOCs to nontoxic compounds.
- Soil gas monitoring at the IR Site 56 plume, where volatile organic compound (VOC) contamination is present in groundwater.
- Monitor and maintain the durable cover.
- Groundwater monitoring of the VOC plume.
- Use of institutional controls (ICs) to restrict specific land uses and activities within portions of Parcel UC-3.

1.2 Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state statutes and regulations that are applicable or relevant and appropriate to the remedy, and is cost effective. The selected remedy uses permanent solutions and alternative treatment technologies to the maximum extent practicable. It provides the best balance of tradeoffs relative to the five balancing criteria and properly considers the two modifying criteria³. The selected remedy does not satisfy the statutory preference for treatment⁴ as a principal element because there is no cost-effective means of treating soil contamination located in separate areas of Parcel UC-3. Statutory five-year reviews pursuant to CERCLA § 121 and the NCP will be conducted because the remedy will leave contamination in place at Parcel UC-3 above concentrations that allow for unrestricted use.

³ As defined in the NCP (Title 40 CFR § 300.430[f][1][i]), the five primary balancing criteria are long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. State and community acceptance are modifying criteria that shall be considered in remedy selection.

⁴ As defined in the NCP (Title 40 CFR § 300.5), "treatment technology" means any unit operation or series of unit operations that alters the composition of a hazardous substance or pollutant or contaminant through chemical, biological, or physical means so as to reduce toxicity, mobility, or volume of the contaminated materials being treated. Treatment technologies are an alternative to land disposal of hazardous wastes without treatment.

1.3 Data Certification Checklist

The following information is included in Section 2.0 of this ROD:

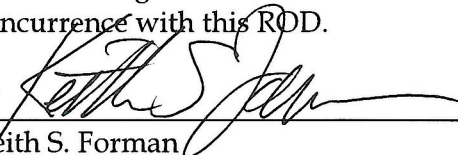
- Chemicals of concern (COCs) and their concentrations (Sections 2.3 and 2.5).
- Baseline risk represented by COCs (Section 2.5).
- Remediation goals (RGs) established for COCs and the basis for these goals (Sections 2.5 and 2.7).
- Principal threat wastes (Section 2.6).
- Current and reasonably anticipated future land use assumptions, and current and potential future beneficial uses of groundwater (Section 2.4).
- Potential land and groundwater use that will be available at Parcel UC-3 as a result of the selected remedy (Section 2.9).
- Estimated capital costs, annual operation and maintenance, and total present worth costs; discount rate; and the number of years over which the remedy cost estimate is projected (Section 2.8).
- Key factors that led to selecting the remedy (i.e., a description of how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (Section 2.9).

Additional information can be found in the Administrative Record file for this site (Attachment A).

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1.4 Authorizing Signatures

This signature sheet documents the Navy's and USEPA's co-selection of the remedy in this ROD. This signature sheet also documents the State of California's (DTSC and RWQCB) concurrence with this ROD.



Keith S. Forman

01/09/2014
Date

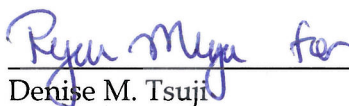
Base Realignment and Closure Environmental Coordinator
Base Realignment and Closure Program Management Office West
United States Department of the Navy



Michael M. Montgomery

1/16/14
Date

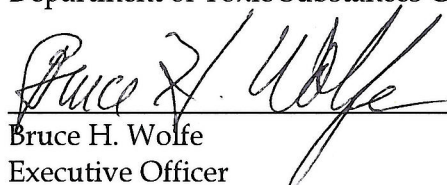
Assistant Director of Federal Facilities
and Site Cleanup Branch, Region 9
United States Environmental Protection Agency



Denise M. Tsuji

1/16/2014
Date

Unit Chief
California Environmental Protection Agency
Department of Toxic Substances Control



Bruce H. Wolfe

1/21/14
Date

Executive Officer
California Environmental Protection Agency
San Francisco Bay Regional Water Quality Control Board

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2.0 Decision Summary

2.1 Site Description and History

HPNS is located in southeastern San Francisco on a peninsula that extends east into San Francisco Bay (Figure 1). HPNS consists of 866 acres: 420 acres on land and 446 acres under water in the San Francisco Bay. In 1940, the Navy obtained ownership of HPNS for shipbuilding, repair, and maintenance activities. After World War II, activities at HPNS shifted to submarine maintenance and repair. HPNS was also the site of the Naval Radiological Defense Laboratory (NRDL). A history of Navy radiological operations at HPNS is provided in the [Historical Radiological Assessment \(HRA\)](#).

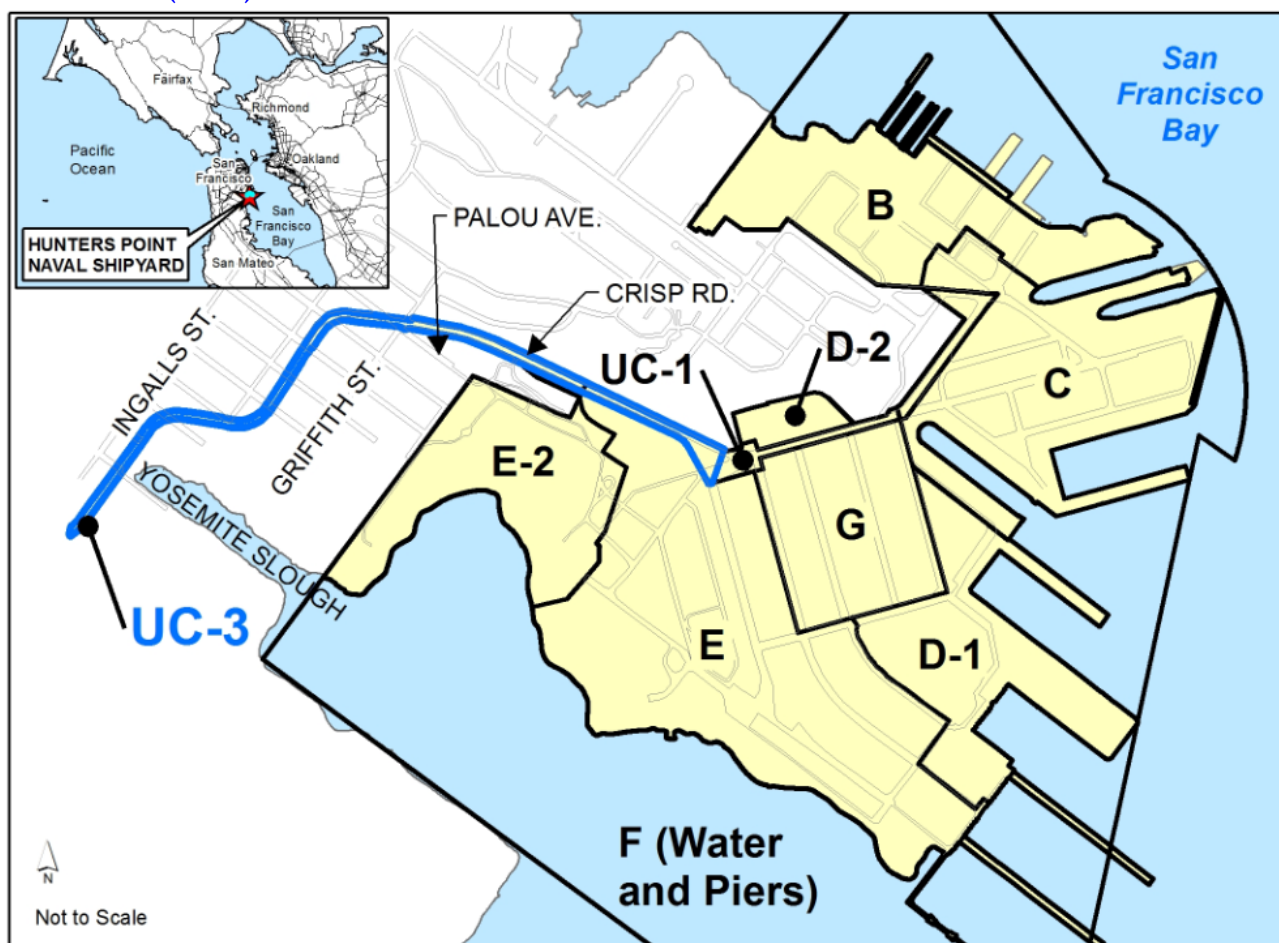


Figure 1. Facility and Parcel UC-3 Location Map

HPNS was deactivated in 1974 and remained relatively unused until 1976. Between 1976 and 1986, the Navy leased most of HPNS to Triple A Machine Shop, Inc. (Triple A), a private ship repair company. In 1987, the Navy resumed occupancy of HPNS. Because past shipyard operations left hazardous substances onsite, HPNS property was placed on the NPL in 1989 pursuant to CERCLA, as amended by the SARA. In 1991, HPNS was designated for closure pursuant to the Defense Base

Closure and Realignment Act of 1990. Closure activities at HPNS involve conducting environmental remediation and making the property available for nondefense use.

Originally, **Parcel UC-3** was within Parcel E. By separating the parcels, Parcel UC-3, a parcel consisting of 11 acres in the western portion of HPNS, was created. Parcel UC-3 is bounded to the north by non-Navy property, to the east by Parcel UC-1, to the south by Parcel E and non-Navy property, and to the west by non-Navy property. Parcel UC-3 includes Crisp Road and the railroad right-of-way (Figure 1). The Navy prepared RI and FS reports for Parcel E that were approved by the FFA Signatories. These documents were finalized in May 2008 and August 2012. The Navy subsequently decided, with FFA Signatory concurrence, to carve out Parcel UC-3 from Parcel E to support a real property conveyance strategy and schedule. The decision was made that the RODs for the amended Parcel E and the new Parcel UC-3 would be based on the Parcel E RI and FS reports and supporting administrative record. The RODs for both the amended Parcel E and new Parcel UC-3 generally address the same investigatory information and the same remedial alternatives evaluated in the Parcel E RI and FS reports.

The railroad right-of-way portion of Parcel UC-3 is located in San Francisco's Bayview neighborhood. The railroad was originally used to transport materials and equipment to and from the shipyard. The chemical contamination of the railroad right-of-way likely resulted from miscellaneous spills while the Navy operated the HPNS. The railroad right-of-way is about 30 feet wide and extends about 3,200 feet west from the end of Crisp Road (near the intersection of Palou Avenue and Griffith Street) to a location near the intersection of Carroll Avenue and Ingalls Street.

The Crisp Road portion of Parcel UC-3 is located adjacent to the northern boundary of HPNS and the western edge is adjacent areas where the former Triple A had a scrapyard to store metal, drums, pipe lagging, liquid waste, and batteries. Triple A also had disposal trenches for waste liquids and a concrete pad where waste liquid drums were crushed. Chemical contamination at Crisp Road likely resulted from Triple A operations which allegedly disposed of hazardous wastes at various locations at HPNS, including **discharging waste oil** in below-ground fuel and steam lines.

Radiological contamination at Crisp Road likely resulted from research activities at various buildings formerly occupied by NRDL. NRDL performed practical and applied research on radiation decontamination methods, the effects of radiation on living organisms, and the effects of radiation on natural and synthetic materials. NRDL activities discharged small amounts of low-level radioactive liquids into the sanitary sewer, storm drains, and septic sewer lines. Parcel UC-3 does not contain radiologically impacted buildings, but many of the sewer and storm drain lines located in Crisp Road were radiologically impacted.

2.2 Site Characteristics

The main portion of HPNS is situated on a long headland in the southeastern part of the City and County of San Francisco, extending eastward into San Francisco Bay. Land at HPNS consists of relatively level lowlands constructed by excavating portions of surrounding hills and placing nonengineered fill materials along the margin of San Francisco Bay. The remaining land is a moderate to steep sloping, northwest-trending ridge. Parcel UC-3 is located in the lowlands, with surface elevations ranging from approximately 10 to 20 feet above mean sea level (msl). Existing site features at Parcel UC-3 are shown on Figure 2.

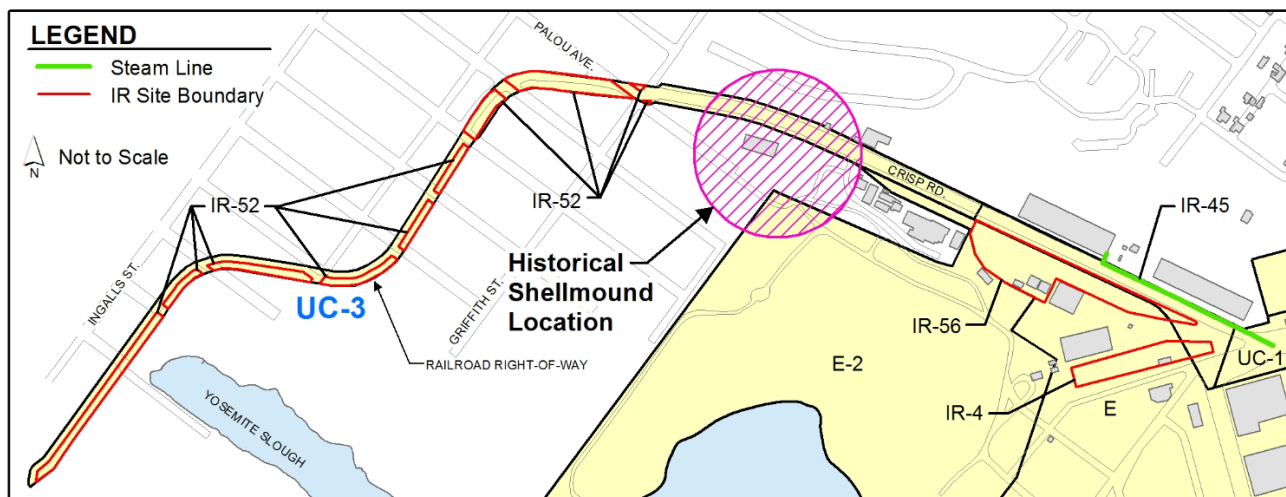


Figure 2. Parcel UC-3 Existing Site Features

There are no surface water features within Parcel UC-3. Surface water at HPNS drains toward the San Francisco Bay primarily as sheet flow. Storm drain and sewer lines throughout Parcel UC-3 were removed from 2009 to 2012 pursuant to the Final Basewide Radiological Removal Action Memorandum. The USEPA and State of California concurred with the Radiological RACR for Parcel UC-3 that was completed in March 2012.

Geology: Five **geologic units** underlie HPNS, including four units of unconsolidated sedimentary deposits of Quaternary age and a fifth of underlying Jurassic-Cretaceous age Franciscan Complex bedrock. The stratigraphic sequence of these geologic units, from youngest (shallowest) to oldest (deepest), is generally Artificial Fill, Undifferentiated Upper Sands, Bay Mud, Undifferentiated Sediments, and Bedrock. Artificial Fill and Bedrock are the most likely units to be encountered above 10 feet below ground surface (bgs), but other units, such as Bay Mud, may be observed along the railroad right-of-way.

Hydrostratigraphy: The following discussion of hydrostratigraphy is based on information presented in the Parcel E FS Report. The information was collected across Parcel E and has been extrapolated to be applicable to Parcel UC-3. Three **hydrostratigraphic units** are found at Parcel UC-3. These include (1) the A-aquifer, (2) the B-aquifer, and (3) the bedrock water-bearing zone. An aquitard composed of the Bay Mud separates the A-aquifer from the B-aquifer across parts of Parcel UC-3.

The A-aquifer at Parcel UC-3 may include (1) Undifferentiated Upper Sands; (2) sandy units within the Bay Mud; and (3) the upper weathered bedrock zone, where the A-aquifer directly overlies bedrock. The A-aquifer covers most of Parcel UC-3 and is generally a few feet thick. The A-aquifer is generally unconfined throughout Parcel UC-3.

The Bay Mud Aquitard separates the A-aquifer from the B-aquifer in a small portion of the eastern part of Parcel UC-3.

The B-aquifer is a sequence of laterally continuous layers of sand and silty and clayey sand, which are separated by laterally continuous layers of silt and clay. The B-aquifer behaves as a single aquifer with the A-aquifer where the Bay Mud Aquitard is absent.

The bedrock water-bearing zone is saturated, fractured, unweathered bedrock with limited flow capability and low storage capacity. The estimated groundwater velocity is 0.12 to 0.34 foot per day.

Primary sources of recharge for the A-aquifer are infiltration of precipitation and runoff, leakage from utility supply lines, horizontal flow of groundwater from upgradient areas, and vertical flow of water from the B-aquifer. The primary sources of recharge for the B-aquifer include infiltration of precipitation and runoff and horizontal groundwater flow from upgradient areas north and west of Parcel UC-3. The bedrock water-bearing zone likely discharges into the B-aquifer at upgradient contacts and is recharged by infiltration of precipitation at outcrop areas north and northwest of Parcel UC-3.

Groundwater: The depth to groundwater at [monitoring well IR74MW01A](#) (the only monitoring well in Parcel UC-3) was 11.48 feet bgs on May 21, 2010 (the last time depth to groundwater was measured before it was abandoned). Between 2006 and 2010, the depth to groundwater in well IR74MW01A ranged from 10.19 to 13.29 feet bgs (-0.13 to 2.97 feet msl).

Groundwater has not been extensively investigated in Parcel UC-3. Based on a [summary of groundwater flow characteristics in Parcel E](#) in the FS Report, groundwater flow at Parcel UC-3 is from southeast to southwest, toward the San Francisco Bay.

Historic Area: A [historic shell mound](#) has been documented along Crisp Road in the eastern portion of Parcel UC-3 (Figure 2). Future CERCLA actions in this area must comply with the provisions outlined within § 106 of the National Historic Preservation Act and its implementing regulations at Title 36 CFR Part 800.

Radiological Operations: Radiological operations did not take place at Parcel UC-3. However, the RACR determined that [radiologically impacted storm drain and sewer lines](#) were previously located under a portion of Crisp Road. These lines were subsequently removed under a [basewide removal action](#) to address radioactive contamination.

2.3 Previous Investigations and Removal Actions

Prior to the preparation of this ROD, Parcel UC-3 was included within Parcel E. Located within Parcel E are several environmental investigation sites identified during the Initial Assessment Study conducted by the Navy in 1984. Since that time, the Navy has performed multiple [environmental investigations](#) at Parcel E to further evaluate the 21-identified IR sites associated with former shipyard operations. Four current IR sites are within or partially within the Parcel UC-3 boundary (Figure 2). The Navy also performed a treatability study for IR Site 56 that involved testing of technology to reduce VOCs in groundwater and a removal action of radiologically impacted sewer and storm drain lines within Parcel UC-3 in 2011.

The Revised Parcel E RI Report (May 2008), Parcel E Groundwater Treatability Study (February 2011), Parcel E Radiological RACR (March 2012), Parcel E FS Report (August 2012), and Parcel UC3 Soil Excavation Characterization (June 2013) collectively summarize the results of the environmental investigations and removal actions, and document the site conditions at Parcel UC-3. Brief summaries of these documents are provided in Sections 2.3.1 through 2.3.4. Based on previous investigations and removal actions, the sources and extent of the remaining contamination in soil and groundwater have been adequately characterized to evaluate site risks, develop remedial alternatives, and support the remedy decision made in this ROD. Table 1 summarizes the previous investigations, treatability studies, and removal actions performed at Parcel UC-3. Since

Parcel UC-3 was recently separated from Parcel E, Table 1 includes investigations and removal actions that were basewide or specific to Parcel E (which included Parcel UC-3). Figure 3 shows the locations where samples were collected to analyze soil and groundwater during the site investigations, as described in the Revised Parcel E RI Report and the Soil Excavation Characterization report; however, soil confirmation sample locations from the basewide removal action to address radiological contamination are not shown ([all concentrations were below established radiological release criteria](#)).

TABLE 1

Previous Investigations and Removal Actions (Parcel UC-3 was included in Parcel E in documents published prior to February 2013)

Previous Investigation/ Removal Action ^a	Date(s)	Investigation/Removal Action Activities
Initial Assessment Survey (IAS)	1984	The IAS assessed the extent of releases of contamination, potential migration pathways, and potential receptors (human or wildlife) where releases of contamination had occurred. The IAS was based on reviews of records and interviews of previous workers at the site. The IAS included one site partially within Parcel UC-3: Installation Restoration (IR) Site 04 (Scrap Yard Shed Building 807).
Confirmation Study and Verification Step	1987	This confirmation study was conducted to verify the presence of hazardous waste contamination. Activities included a geophysical survey; subsurface exploration using exploratory borings; and soil, groundwater, and air sampling. The study included one site partially within Parcel UC-3: IR Site 04.
Area Study	1987	This study evaluated whether asbestos-containing material (ACM) was present in areas of HPNS where potential future construction would occur or potential hazardous materials were located. The study consisted of surface sampling for ACM, shallow subsurface exploration using exploratory borings, soil sampling, and laboratory analyses. The study included one site partially within Parcel UC-3: IR Site 04.
Scoping Document Summary	1988	The scoping document summarized (1) previous activities and investigations, (2) ongoing or planned investigations and how they relate to the remedial investigation/feasibility study (RI/FS) process, (3) the Navy's approach to investigating and remediating sites under the RI/FS process and the field investigations to be conducted as part of the RI, and (4) proposed investigation activities for sites identified during the IAS, confirmation study, and Triple A investigation. Sites were grouped into operable units.
Remedial Investigation Phase I Reconnaissance	1988	The RI evaluated hydrogeologic conditions and identified waste boundaries using ground-penetrating radar, electromagnetic survey, and test pits to delineate the extent of waste depositions in fill material. Surface scintillation counts also were measured to evaluate whether surface radiation exceeded HPNS background levels.
Preliminary Assessment	1989 to 1990	The preliminary assessment reviewed existing documents to (1) identify buildings or areas where chemicals were used, stored, or disposed of; (2) evaluate potential environmental effects of underground utilities (e.g., steam lines, storm and sanitary sewer lines, fuel lines); (3) identify potential receptors and threats to human health and the environment; (4) evaluate the need for immediate removal actions; (5) assess priorities for subsequent site inspection activities; and (6) identify which IR sites required no further action or investigation.
Sandblast Waste Fixation	1991 to 1995	More than 4,900 tons of sandblast waste were collected from locations around HPNS, temporarily stockpiled at Parcel E, and sent to an asphalt plant for recycling.

TABLE 1

Previous Investigations and Removal Actions (Parcel UC-3 was included in Parcel E in documents published prior to February 2013)

Previous Investigation/ Removal Action ^a	Date(s)	Investigation/Removal Action Activities
Remedial Investigation	1992 to 1996	The RI evaluated the nature and extent of contamination in soil and groundwater at Parcel E. More than 4,700 soil and 1,200 groundwater samples were collected and analyzed for various hazardous substances, including metals, organic chemicals, and total petroleum hydrocarbons (TPH). All data were compared with screening criteria for the protection of humans and wildlife. Additionally, an HHRA for soil and groundwater and an ecological risk assessment (ERA) for soil were conducted.
Facility-wide Ambient Air Monitoring (Phases I, II, and III)	1992, 1994, and 1996	Ambient air sampling was conducted at selected locations, including Parcel E, in three phases at HPNS. Phase I focused on testing air upwind and downwind of approximately 25 percent of the contaminated sites. Phase II tested upwind and downwind conditions of the remaining 75 percent of potential contaminated sites. Phase III sampling was conducted to address uncertainties associated with Phase II sampling.
Site Inspection	1993 to 1994	Soil and groundwater samples were collected and analyzed for metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and TPH to further evaluate whether contamination was present and whether a release to the environment had occurred. Additionally, results were used to characterize site-specific hydrogeologic conditions and evaluate whether a site should be included in the RI for further investigation. Utility lines (steam, storm drain, and sanitary sewer) were mapped, surveyed, visually inspected, and sampled. Geophysical surveys were conducted to map fuel lines and located suspected underground storage tanks (USTs).
Site Assessment (SA)	1993 to 1994	The SA evaluated 75 sites, including 110 buildings and areas. Specifically, the SA evaluated areas that had not been previously investigated under the IR Program because of lack of access or documentation, and areas that might have been conducted by recent (a decade prior to the SA) activities. The SA consisted of a records review, personnel interviews, and a field inspection to identify potential areas of contamination.
Phases 1A and 1B Ecological Risk Assessment	1994 to 1996	The Phase 1A ERA was a qualitative analysis that developed a preliminary characterization of HPNS based on existing data, biotic surveys, and contaminant migration pathways and exposure routes. Both terrestrial and aquatic environments were considered in the Phase 1A ERA. The quantitative Phase 1B ERA was performed to delineate potential gradients of contamination from onshore sources to offshore sediments, and to characterize the risk to aquatic wildlife.
Removal of Sediment from the Storm Drain System	1996 to 1997	More than 1,200 tons of sediment and debris were removed from storm drain lines across HPNS, including from storm drain lines in Parcel E, to reduce the potential for chemicals to be transported to San Francisco Bay.
Feasibility Study	1997 to 1998	The FS identified, screened, and evaluated remedial alternatives for cleanup of soil and groundwater at Parcel E.
Validation Study and Protective Soil Concentrations	1999 to 2000	The validation study addressed some of the uncertainties associated with dose calculations (from the Baseline ERA (BERA)). Additionally, tissue from plants, invertebrates, lizards, and small mammals was collected, and tissue data were used to develop site-specific chemical soil concentrations that would be protective of terrestrial wildlife.

TABLE 1

Previous Investigations and Removal Actions (Parcel UC-3 was included in Parcel E in documents published prior to February 2013)

Previous Investigation/ Removal Action ^a	Date(s)	Investigation/Removal Action Activities
Groundwater Data Gaps Investigation	2000 to 2002	The GDGI was conducted in three phases between 2000 and 2002 to update previous assessments of groundwater conditions at HPNS, supplement information gathered during the Parcel E RI, and better define the extent of groundwater contamination at HPNS.
Historical Radiological Assessment (HRA)	2003 to 2004	The HRA identified 33 areas in Parcel E as radiologically affected (at the time of the study, Parcel E included what is now Parcel UC-3). These areas were small such as former building foundation footprints and fill areas that may contain dials, gauges, deck markers, or sandblast waste. The HRA also identified basewide utility systems as affected areas, including the underground storm drain and sanitary sewer lines. The HRA reported that no radiological contamination was suspected in groundwater at Parcel UC-3. Nevertheless, the HRA concluded that further evaluation of the affected areas was required.
Landfill Gas Monitoring and Control	2003 to Present	Landfill gas is being monitored on a regular basis under the Interim Landfill Gas Monitoring and Control Plan to verify that hazardous concentrations of landfill gas are not migrating beyond the fence line of the landfill and onto the University of California San Francisco compound. Many of the monitoring points are within Parcel UC-3. The landfill gas control system is operated using both passive venting and active extraction.
TPH Corrective Action Program	2004	TPH is not included in the definition of hazardous substances under CERCLA. However, this exclusion only applies to TPH contamination that is separate and distinguishable from other hazardous wastes. Therefore, all sites where TPH is commingled with CERCLA-regulated substances have been addressed under the Navy's IR Program process. Such areas will be included in the final remedy selected for Parcel E.
Basewide Groundwater Monitoring Program	2004 to present	Groundwater at HPNS is monitored on a quarterly basis. The number of wells, location of wells, and analytes is determined through the basewide groundwater monitoring program.
Revised Remedial Investigation, including HHRA and ERA	2008	During the Revised RI, additional data were collected to better characterize Parcel E to support remedy evaluation at the site. To address data gaps, additional field investigations were performed to gather supplementary information needed to support the remedy evaluation.
Basewide Radiological Time-Critical Removal Action (TCRA)	2009 to present	TCRA activities in Parcel UC-3 identified and removed low-level radiological material with radioactivity levels exceeding the TCRA removal goals and remediation goals (RGs) at all radiologically affected sites, including storm drain and sewer lines. The fieldwork on Parcel UC-3 was completed in June 2011. The United States Environmental Protection Agency (USEPA) and the State of California concurred with the Radiological removal action completion report (RACR) for Parcel UC-3 that was completed in March 2012.
Treatability Study	2009 to 2011	This GWTS included a study of possible zero valent iron (ZVI) use at IR Site 56.
Feasibility Study	2012	The FS identified, screened, and evaluated remedial alternatives for cleanup of soil and groundwater at Parcel E.

TABLE 1

Previous Investigations and Removal Actions (Parcel UC-3 was included in Parcel E in documents published prior to February 2013)

Previous Investigation/ Removal Action ^a	Date(s)	Investigation/Removal Action Activities
Soil Excavation Characterization	2013	A soil investigation was conducted to determine the lateral and vertical extent of COCs associated with excavation areas in Parcel UC-3.
Proposed Plan	2013	The Proposed Plan presented remedial alternatives and selected the proposed alternatives, to be further described in this Record of Decision (ROD).

Notes:

^a The documents listed in this table are available in the Administrative Record and provide detailed information used to support the remedy selection for Parcel UC-3.

ACM - asbestos-containing material
 AST - aboveground storage tank
 BERA - baseline ecological risk assessment
 COC - chemical of concern
 ERA - ecological risk assessment
 FS - feasibility study
 GDGI - groundwater data gaps investigation
 GWTS - groundwater treatability study
 HHRA - human health risk assessment
 HPNS - Hunters Point Naval Shipyard
 HRA - historical radiological assessment
 IAS - initial site assessment
 IR - Installation Restoration
 mg/kg - milligram per kilogram

PCB - polychlorinated biphenyl
 RACR - removal action completion report
 RAO - remedial action objective
 RG - remediation goal
 RI - remedial investigation
 ROD - Record of Decision
 SA - site assessment
 SVOC - semivolatile organic compound
 SWAQAT - solid waste air quality assessment test
 TCRA - time-critical removal action
 TPH - total petroleum hydrocarbons
 USEPA - United States Environmental Protection Agency
 UST - underground storage tank
 VOC - volatile organic compound
 yd³ - cubic yard
 ZVI - zero valent iron

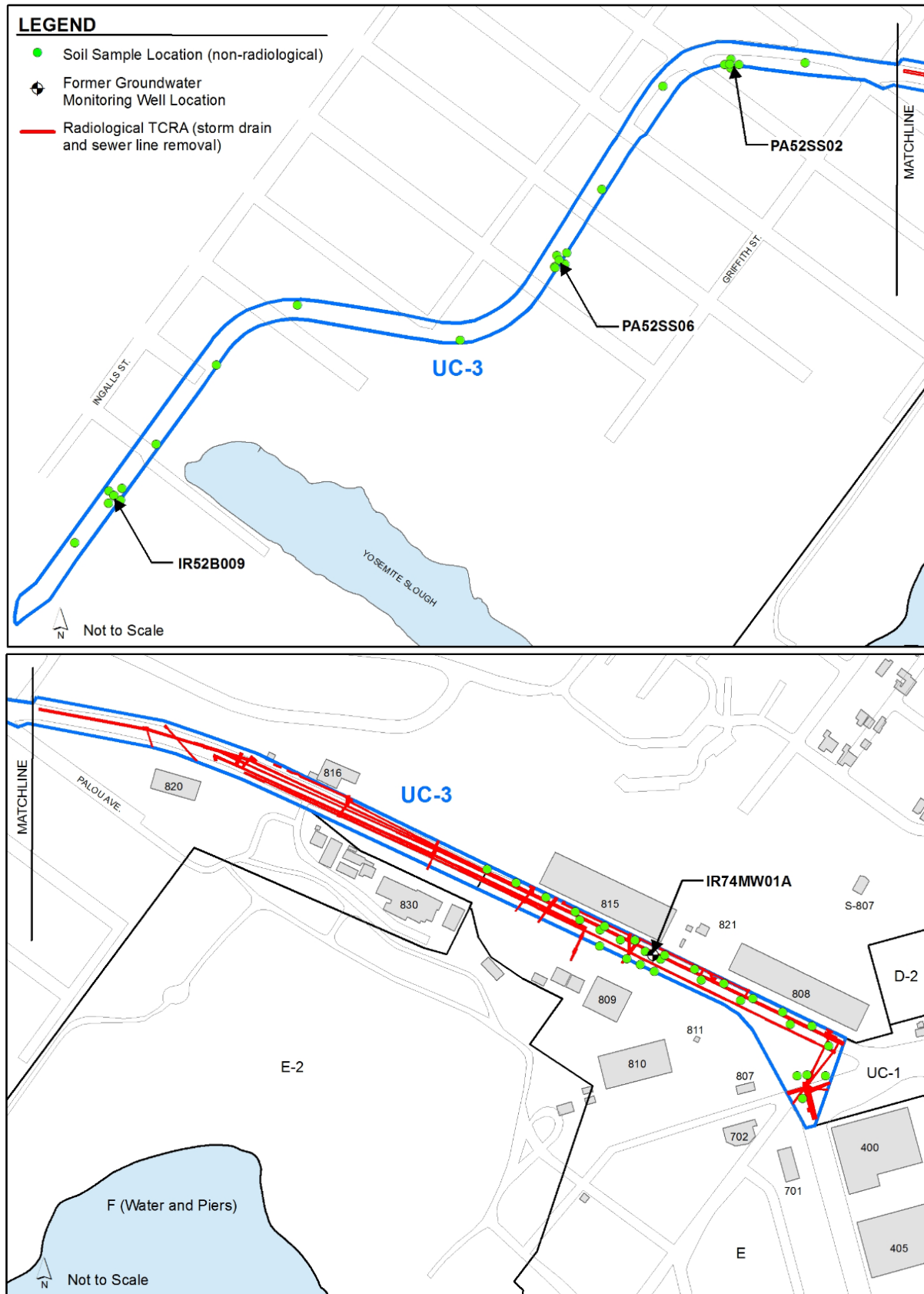


Figure 3. Previous Soil and Groundwater Sampling Locations

2.3.1 Revised Parcel E RI Report

The **Revised Parcel E RI Report** used residential and industrial screening criteria to screen chemical data for redevelopment areas based on the **1997 Redevelopment Plan**. Additionally, human health risk was evaluated for various exposure scenarios; planned reuse (as of 1997), residential, industrial, recreational, and construction worker. A BERA was completed and no unacceptable risk to ecological receptors was indicated at Parcel UC-3. Human health and ecological risks are summarized in Section 2.5.

The Revised Parcel E RI identified four IR sites that are located within or partially within Parcel UC-3 (Figure 2):

- IR Site 4 (partial) – A scrapyard and scrap material area where the Navy stored used submarine batteries, electrical capacitors, and steel. The area was leased to Triple A in 1976 who also used it as a scrapyard. Drums, pipe lagging, batteries, liquid wastes, and scrap metal were found at the site. Stained soil was observed at the site.
- IR Site 45 (partial) – Basewide steam line system. Triple A is suspected of using the steam line system to transport waste oil.
- IR Site 52 – The railroad and its surrounding right-of-way, which was leased to Triple A in 1976. Stained soil, spilled paint, household waste, and abandoned buildings were observed during past investigations.
- IR Site 56 (partial) – The Railroad Yard Area. Use of wood preservatives and railroad cleaning solvents was suspected. Evidence of paint leakage from storage containers was observed.

Soil investigations at Parcel UC-3 identified SVOCs, metals, and TPH, at **concentrations that exceeded industrial screening criteria** used in the Revised Parcel E RI. The Navy completed 55 soil borings within Parcel UC-3 to evaluate the nature and extent of contamination (Figure 3).

Additionally, one monitoring well (IR74MW01A) was installed in Parcel UC-3, and soil samples were collected from the boring. Well IR74MW01A was installed as part of the investigation of IR Site 74 and is located south of the IR Site 74 boundary but within Parcel UC-3. IR Site 74 is now part of the Formerly Utilized Defense Sites (FUDS) program and is not included in this ROD.

The Revised Parcel E RI identified **three redevelopment units based on the 1997 Redevelopment Plan** that were located within or partially within Parcel UC-3: all of EOS-5, most of EOS-4, and a small part of redevelopment block 45. The planned reuse for EOS-5 was open space. IR Site 52 is located completely within EOS-5. One of 39 soil samples collected within EOS-5 contained metals at concentrations above the industrial screening criteria used in the Revised Parcel E RI (Table 2). One of 39 soil samples collected within EOS-5 contained SVOC concentrations above the industrial screening criteria used in the Revised Parcel E RI (Table 3). No other soil samples had concentrations above the industrial screening criteria used in the Revised Parcel E RI.

TABLE 2
Metals Concentrations in Soil Exceeding Industrial Screening Criteria

Point ID	Analyte	Result (mg/kg)	Screening Criterion (mg/kg)	Depth (feet bgs)
PA52SS06	Arsenic	12.8	11.8 (HPAL)	0.75
PA52SS06	Lead	1,280	800 (Industrial)	0.75

Notes:

bgs - below ground surface

HPAL - Hunters Point ambient level

mg/kg - milligram per kilogram

TABLE 3
SVOC Concentrations in Soil Exceeding Industrial Screening Criteria

Point ID	Analyte	Result (mg/kg)	Screening Criterion (mg/kg)	Depth (feet bgs)
IR52B009	Benzo(a)anthracene	8.8	1.8 (Industrial)	3.75
IR52B009	Benzo(a)pyrene	13.0	0.2 (Industrial)	3.75
IR52B009	Benzo(b)fluoranthene	21.0	1.8 (Industrial)	3.75
IR52B009	Benzo(k)fluoranthene	3.5	1.8 (Industrial)	3.75
IR52B009	Dibenz(a,h)anthracene	1.7	0.3 (Industrial)	3.75
IR52B009	Indeno(1,2,3-c,d)pyrene	5.2	1.8 (Industrial)	3.75

Notes:

bgs - below ground surface

HPAL - Hunters Point ambient level

mg/kg - milligram per kilogram

The 1997 Redevelopment Plan did not identify a planned reuse for EOS-4. EOS-4 contains railroad tracks that leave the former Golden Gate Railroad Museum and merge onto EOS-5. There have been no reports of observed chemical releases such as stained soil within EOS-4. No areas exceeding the industrial screening criteria used in the Revised Parcel E RI were identified.

Based on the 1997 Redevelopment Plan, the planned reuse for Redevelopment Block 45 was research and development. IR Site 56 and a small portion of IR Site 4 were located within Redevelopment Block 45. Concentrations of metals above the residential screening criteria used in the Revised Parcel E RI were found throughout Redevelopment Block 45, including the portion within Parcel UC-3. Concentrations of one SVOC (benzo[a]pyrene) and TPH were above the residential screening criteria used in the Revised Parcel E RI at one location within Parcel UC-3 (IR56B037). However, this location will not be addressed in this ROD because the area near IR56B037 is being managed by the Navy under the Hunters Point TPH program. One groundwater plume (IR Site 56 plume) within Parcel UC-3 was identified, with TCE concentrations above vapor intrusion criteria.

2.3.2 Parcel E Groundwater Investigations

Groundwater conditions at Parcel UC-3 were evaluated only at monitoring well IR74MW01A as part of the basewide groundwater monitoring program. Groundwater investigations at and near Parcel UC-3 have identified a groundwater plume (IR Site 56) with concentrations of TCE that exceeded the vapor intrusion criterion used in the Revised Parcel E RI (2.9 micrograms per liter [$\mu\text{g}/\text{L}$]). **Well IR74MW01A was sampled** during 1996, 2004, 2006, 2008, and 2009, and TCE concentrations ranged from less than 0.5 $\mu\text{g}/\text{L}$ to 4 $\mu\text{g}/\text{L}$. In 2009, groundwater samples were also collected from five direct-push sampling locations to evaluate baseline conditions during a **groundwater treatability study** (GWTS). Data from the well and direct-push sampling locations in 2009 indicated that the **plume delineation** presented in the RI had not changed (Figure 4).

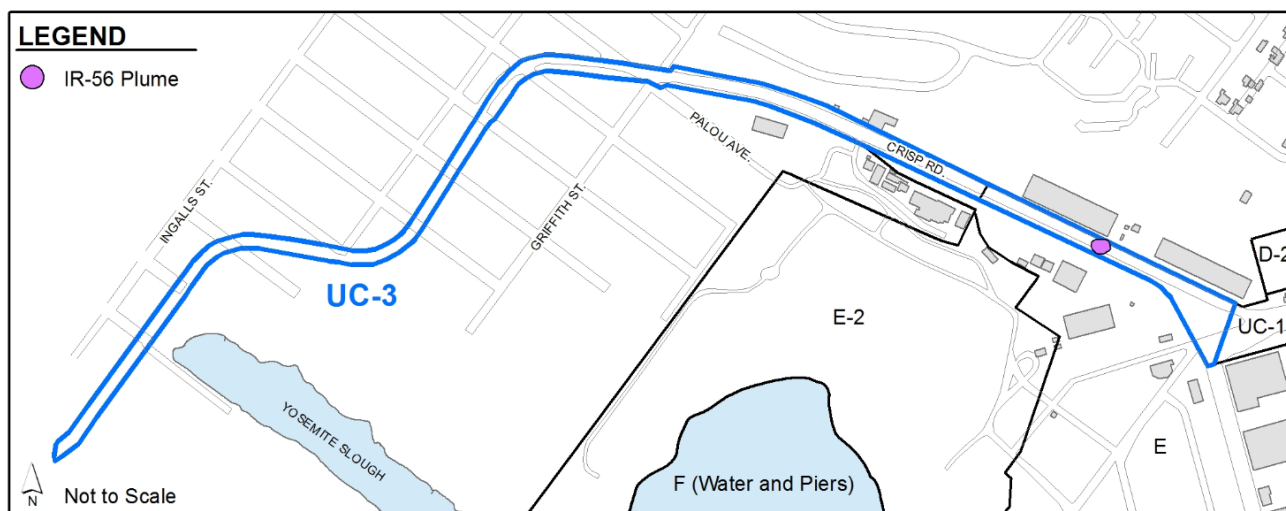


Figure 4. IR Site 56 Groundwater Plume Location

The Navy performed the GWTS to evaluate the effectiveness of ZVI injection in treating groundwater contamination. The GWTS was implemented in two phases: (1) a plume characterization phase, during which groundwater and soil vapor samples were collected to better delineate the groundwater plumes identified in the Revised Parcel E RI Report (Phase I); and (2) treatment, if necessary, of selected plumes using ZVI (Phase II). Based on the Phase I characterization, ZVI injections were not recommended for the IR Site 56 TCE plume because concentrations of COCs did not significantly exceed their respective project-specific goals.

2.3.3 Parcel E Radiological RACR

A history of radiological operations by the Navy at HPNS is presented in the HRA. The HRA identified radiological-affected sewer and storm drain lines across Parcel UC-3. The source of potential radioactive contamination at Parcel UC-3 was research activities at various buildings formerly occupied by NRDL. NRDL performed practical and applied research on radiation decontamination methods and on the effects of radiation on living organisms and natural and synthetic materials. NRDL activities may have discharged small amounts of low-level radioactive liquids into sanitary sewer, storm drain, and septic sewer lines. As a result, sanitary sewer, storm drain, and septic sewer lines throughout Parcel UC-3 were affected. Therefore, storm drain and sewer lines throughout Parcel UC-3 were removed from 2009 to 2012 pursuant to the Final Basewide Radiological Action Memorandum. The removal action included all sewer and storm drain lines within Parcel UC-3, as well as potentially impacted soil. A **Radiological RACR** for

Parcel UC-3 was submitted on March 16, 2012, and received concurrence for radiological unrestricted release from DTSC on October 31, 2012. All work required by the selected radiological remedy, Alternative R-2, has been completed, and no additional actions are required. Selection of Alternative R-2 is documented in this ROD.

2.3.4 Parcel E FS Report

The **Parcel E FS Report** was based on the **2010 Redevelopment Plan** and evaluated alternatives for soil and groundwater. Excavation options were focused on removing COCs in soil at concentrations significantly above preliminary remediation goals (PRGs) (by either 5 or 10 times) and COCs indicative of a potential source of groundwater contamination.

Based on the 2010 Redevelopment Plan, Parcel UC-3 contains two redevelopment units: the railroad right-of-way and a portion of Redevelopment Block MU-3 (Figure 5). No redevelopment unit was identified for the former EOS-4 redevelopment unit. The 2010 Redevelopment Plan proposed light industrial use for the railroad right-of-way and mixed use for Redevelopment Block MU-3. Based on existing surrounding uses, the former EOS-4 redevelopment unit has been screened for industrial use in this ROD.

During the process of identifying potential soil areas for removal, the Navy focused the list of COCs to those nonradioactive chemicals present at concentrations that exceeded the PRGs. The PRGs generally correspond to a cancer risk of greater than 1 in 1,000,000 or a noncancer Hazard Index (HI) greater than 1. Areas of soil that contain elevated COC concentrations that pose the most significant risk to humans were referred to as hot spots. Hot spot locations were initially categorized as Tier 1 or Tier 2 locations. Tier 1 locations contained COCs at concentrations greater than 10 times the PRGs (the Tier 1 action levels). Tier 2 locations contained COCs at concentrations greater than 5 times the PRGs (the Tier 2 action levels), thus Tier 2 locations include all Tier 1 locations. Tier 1 and Tier 2 action levels do not apply to TPH concentrations. Instead, TPH locations were defined as soil that contained TPH at concentrations greater than the PRG.

In the eastern portion of Parcel UC-3 (which corresponds to the portion of Redevelopment Block MU-3 that lies in Parcel UC-3), no areas of soil exceeded the residential screening criteria used in the Revised Parcel E RI, except for one location in Parcel UC-3 that is being addressed under the Hunters Point TPH program. The Revised Parcel E RI did not identify areas exceeding the RI screening criteria within the area between Redevelopment Block MU-3 and the railroad right-of-way. No soil samples have been collected in this area because no IR Sites or evidence of spills or soil staining were identified. In the railroad right-of-way, the Revised Parcel E RI screening process identified no contiguous areas that exceeded screening criteria for soil. However, at three isolated boring locations, SVOCs, TPH, or metals **concentrations exceeded industrial screening criteria** used in the Revised Parcel E RI. Two of the locations exceeded the Tier 2 action levels of 5 times the PRGs for either SVOCs or metals, and one location exceeded the PRG for TPH. At boring IR52B009, a soil sample (3.5 feet bgs) reported concentrations of six SVOCs exceeding industrial screening criteria used in the Revised Parcel E RI. At boring PA52SS02, in a soil sample collected at approximately 0.5 foot bgs, a TPH concentration exceeded industrial screening criteria used in the Revised Parcel E RI. At boring PA52SS06, in a soil sample collected at approximately 0.5 foot bgs, copper and lead concentrations exceeded the Tier 2 action levels. In 2012, the Navy collected soil samples surrounding each of these boring locations to identify the extent of contamination at each location to define the appropriate excavation area. These locations are further discussed in Section 2.9.2.1. Soil samples show that the excavation areas are adequately bound on four sides.

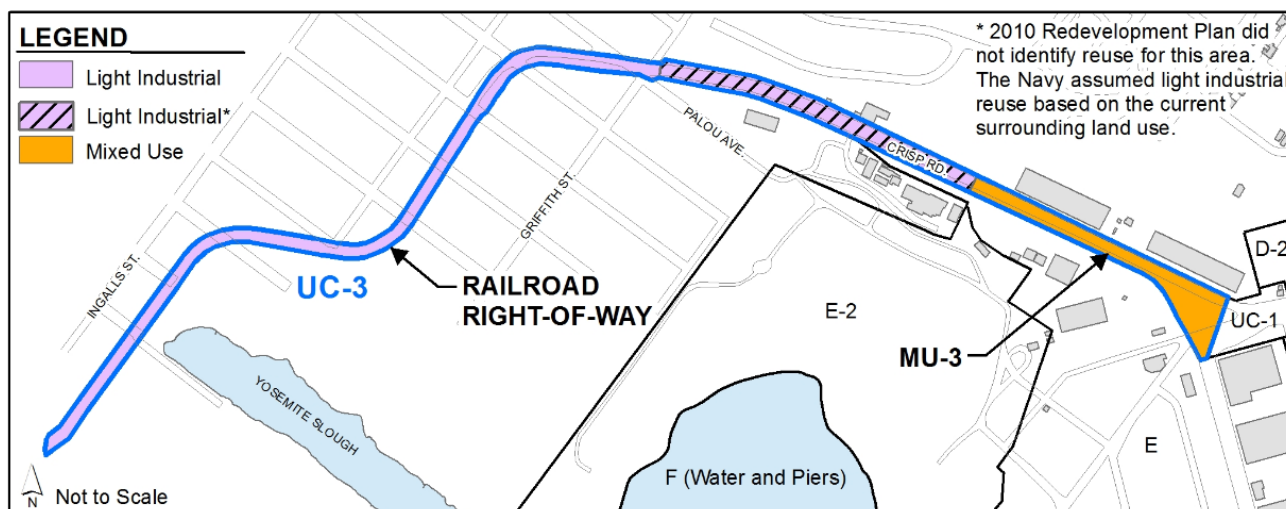


Figure 5. Planned Reuses

2.4 Current and Potential Future Site Uses

The 2010 [amended redevelopment plan](#) from the City and County of San Francisco (CCSF) outlines the proposed reuse for Parcel UC-3. The Navy divided Parcel UC-3 into reuse areas based on the redevelopment plan and, in the case of the western half of Crisp Road, to reflect the surrounding neighborhood light industrial uses. The data analysis, risk evaluations, and remedial alternatives presented in the Revised RI Report and FS Report assumed that the future reuse of Redevelopment Block MU-3 will be mixed use, and the future use of the area between the railroad right-of-way and Redevelopment Block MU-3 and the railroad right-of-way will be light industrial (Figure 5). For this ROD, the area designated as “no identified reuse” in the 2010 amended redevelopment plan has been screened against criteria for light industrial use. This is consistent with existing surrounding land use and this area (the area between the railroad right-of-way and Redevelopment Block MU-3), and the railroad right-of-way will have institutional controls restricting residential development.

The Revised RI Report provides an assessment of the municipal and domestic drinking water beneficial uses of Parcel E groundwater, focusing on the A-aquifer with respect to federal criteria and the B-aquifer with respect to federal and state criteria. Appendix F of the Revised RI Report provides a detailed discussion of the beneficial use evaluation of groundwater at Parcel E. The Revised RI Report did not evaluate the A-aquifer with respect to state criteria because [RWQCB concurred](#) with the Navy’s determination that the A-aquifer is not suitable or potentially suitable as a municipal or domestic water supply and meets exemption criteria in State Water Resources Control Board (SWRCB) Resolution 88-63 and RWQCB Resolution 89-39. Based on the federal groundwater classification criteria and the evaluation of site-specific factors (SSFs), the A-aquifer is not a viable source of drinking water, and federal maximum contaminant levels (MCLs) are not applicable or relevant and appropriate requirements (ARARs) for the CERCLA action. Furthermore, based on the SSF evaluation, the B-aquifer has potential beneficial use as drinking water across most of the parcel, and MCLs are ARARs; however, CCSF regulatory controls prohibit domestic use of groundwater at Parcel UC-3 without CCSF approval, and the CCSF has no current plans to install wells for drinking water.

Agricultural beneficial use of the A-aquifer and B-aquifer groundwater is limited to areas with total dissolved solids at concentrations less than 1,500 milligrams per liter (mg/L) for irrigation and less than 10,000 mg/L for livestock. Both the A- and B-aquifers have potential industrial beneficial use. According to the Basin Plan (RWQCB, 2007), site-by-site determinations of the freshwater replenishment beneficial use will be made. Freshwater replenishment has been determined to be a beneficial use of the groundwater at Parcel UC-3.

2.5 Summary of Site Risks

Potential contamination at Parcel UC-3 is attributable to miscellaneous spills while the Navy operated and maintained the railroad. Additionally, contamination from the IR Site 56 (Building 809 lumber storehouse; railroad yard area used to clean metal parts; and open storage yard for scrap metal, motors, and batteries) migrated into the eastern portion of Parcel UC-3. Contaminated media at Parcel UC-3 consists of soil and groundwater. The primary contaminant transport mechanisms are water infiltration and percolation into subsurface soil and groundwater. A general conceptual site model (CSM) for Parcel UC-3 is provided on Figure 6. Based on the CSM, Parcel UC-3 was assessed for potential risks to human health and the environment during the RI/FS and described in the Revised RI Report, FS Report, and the Radiological Addendum to the FS Report. Section 2.5.1 presents the results of the HHRA. Section 2.5.2 presents the results of the ERA.

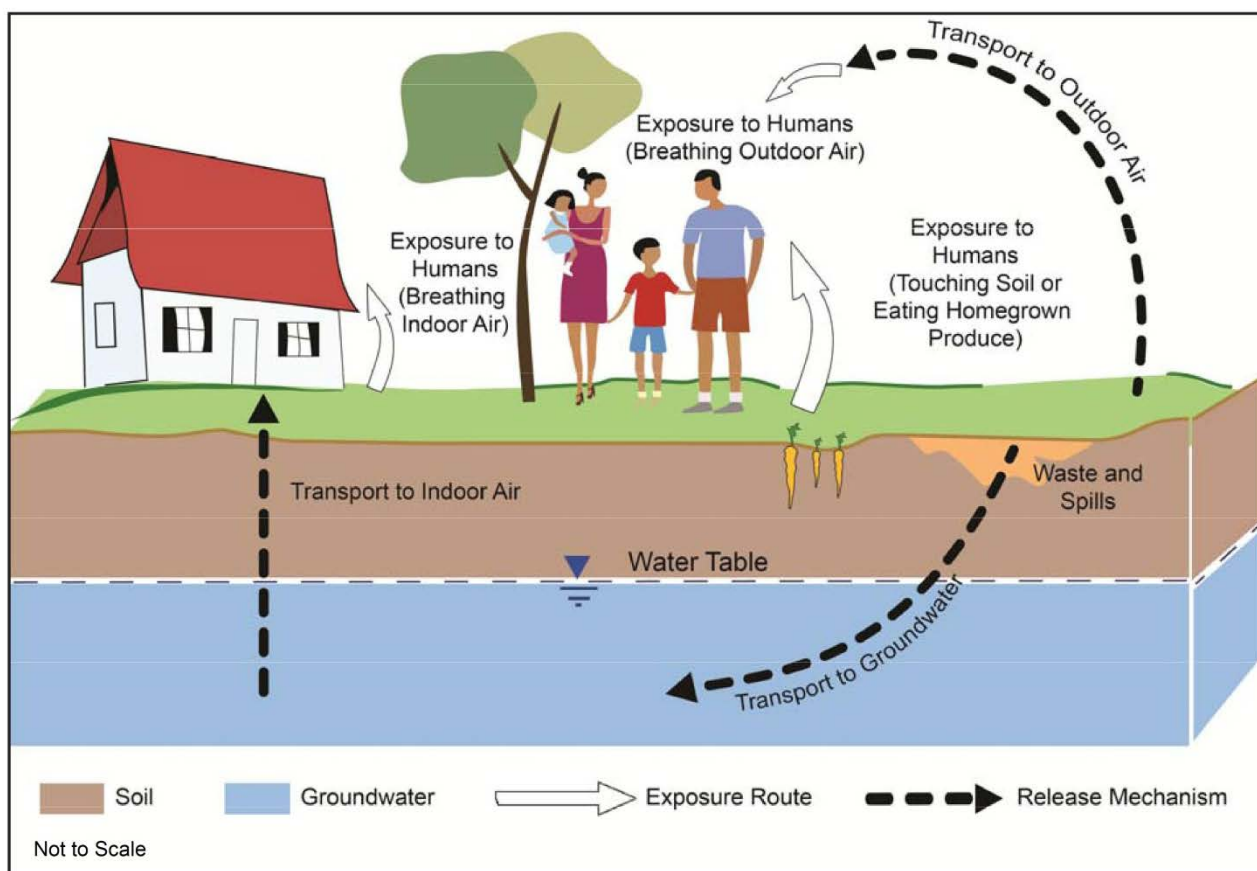


Figure 6. Conceptual Site Model

2.5.1 Human Health Risk Assessment

Based on **a CSM for human health, a quantitative HHRA** was completed for soil and groundwater at Parcel E, which included Parcel UC-3 at the time the HHRA was completed. The Navy evaluated risk to human health at Parcel UC-3 in the HHRA presented in the Revised Parcel E RI Report and the Radiological Addendum to the Parcel E FS Report. The baseline HHRA was conducted for Parcel E to accomplish the following:

- Estimate the magnitude of potential risks to human health associated with current site conditions and potential future land use scenarios.
- Identify the environmental media and contaminants that pose the primary health concerns or pose little or no threat to human health.
- Provide the basis to support risk management decisions about the need for further action.

The HHRA was conducted assuming the long-term uses for Parcel UC-3 include mixed use in the portion of Redevelopment Block MU-3 that is within Parcel UC-3, and light industrial use in the railroad right-of-way. The portion of Parcel UC-3 between the railroad right-of-way and the eastern part of Parcel UC-3 where Redevelopment Block MU-3 is located was not evaluated in the HHRA. The Navy evaluated the reuses using residential, industrial, and recreational exposure scenarios.

Potential cancer risks and noncancer hazards were calculated based on reasonable maximum exposure (RME) assumptions recommended by USEPA and DTSC. These assumptions are based on an RME rather than an average or medium range exposure assumption to provide a conservative and protective approach that estimates the highest health risks that are reasonably expected to occur at a site.

Cancer risk is the estimated probability that a person will develop cancer from exposure to site contaminants and is generally expressed as an upper-bound probability. For example, a 1 in 1,000,000 chance is a risk that for every 1,000,000 people, one additional cancer case may occur as a result of exposure to site contaminants. The Navy adopted a conservative approach at Parcel E, including Parcel UC-3, and evaluated action where potential risk exceeded 1 in 1,000,000, which meets the most conservative end of the risk management range established by USEPA.

Noncancer hazard is the risk of health effects other than cancer and is expressed as a number called the HI. An HI of 1 or less is considered an acceptable exposure level for noncancer health hazards. The Navy evaluated action at Parcel E areas with an HI greater than 1.

Both **total and incremental risks** were evaluated for exposure to soil at Parcel E, including Parcel UC-3. For the total risk evaluation, all detected chemicals, with the exception of calcium, magnesium, potassium, and sodium (essential nutrients), were included as chemicals of potential concern (COPCs), regardless of concentration. The total risk evaluation provides an estimate of the risks posed by all chemicals at Parcel E and Parcel UC-3, including those present at concentrations at or below ambient levels. For the incremental risk evaluation, the essential nutrients and metals with maximum measured concentrations less than the Hunters Point ambient levels (HPALs) were excluded as COPCs. The incremental risk evaluation provides an estimate of risks posed by all chemicals at Parcel UC-3, except those that do not exceed ambient levels.

Potential unacceptable risks include cancer risks and noncancer hazards for future receptors from exposure to soil or groundwater, as shown in Tables 4 and 5. Potential unacceptable risk is defined

as an excess lifetime cancer risk of greater than 1 in 1,000,000 or a segregated HI greater than 1, as calculated by the incremental risk evaluation.

The cancer risk and HI presented in Table 4 for Redevelopment Block MU-3 were calculated utilizing soil data from the Revised Parcel E RI within Redevelopment Block MU-3. Metals drive the cancer risk and HI in the portion of Redevelopment Block MU-3 that is within Parcel UC-3. Parcel UC-3 includes only a small portion of Redevelopment Block MU-3 and none of the Tier 2 hot spot locations are present within the Parcel UC-3 portion of Redevelopment Block MU-3. A separate HHRA was not conducted for the Parcel UC-3 portion of Redevelopment Block MU-3.

Based on the [HHRA results for chemicals in soil and groundwater](#), cancer risks exceeded 1 in 1,000,000, and HI were greater than 1 (Tables 4 and 5). The HHRA did not calculate a risk for the area between the railroad right-of-way and Redevelopment Block MU-3 (Figure 5) because no results exceeded the screening criteria used in the RI and there are no IR Sites in this area. The highest cancer risks and HI in soil were driven by concentrations of SVOCs, TPH, and metals (copper and lead) in three separate locations in the railroad right-of-way. The highest cancer risks and noncancer hazards in groundwater were estimated for future residents that could theoretically breathe VOC vapors that may have migrated from shallow groundwater through the shallow soil beneath Parcel UC-3.

TABLE 4
Cancer Risks and Noncancer Hazards, Soil

Reuse Area	Parcel	Exposure Scenario	Chemical Cancer Risk	Hazard Index
MU-3	E / UC-3 ^a	Residential	1 in 1,000	65
Railroad Right-of-Way	UC-3	Industrial	5 in 100,000	<1

Notes:

Listed risk value is maximum in each reuse area; risk is based on conditions before cleanup (including prior to interim removal actions).

^a HHRA completed for entire Redevelopment Block MU-3, which includes a portion of Parcel E and Parcel UC-3.

TABLE 5
Cancer Risks and Noncancer Hazards, Groundwater

Reuse Area	Parcel	Exposure Scenario	Chemical Cancer Risk	Hazard Index
Breathing Indoor Air from Shallow Groundwater				
MU-3	E / UC-3 ^a	Residential	8 in 100,000	2.9

Notes:

Listed risk value is maximum in the reuse area; risk is based on conditions before cleanup (including prior to interim removal actions).

^a HHRA completed for entire Redevelopment Block MU-3, which includes a portion of Parcel E and Parcel UC-3.

The HHRA specifies the [assumptions and uncertainties](#) inherent in the risk assessment process as a result of the number of samples collected or their locations, the literature-based exposure and toxicity values used to calculate risk, and the risk characterization across multiple media and exposure pathways. The effects of uncertainties are overestimation or underestimation of the actual

cancer risk or HI. In general, the risk assessment process is based on the use of conservative (health protective) assumptions that when combined are intended to overestimate the actual risk.

2.5.2 Ecological Health Risk Assessment

The Navy performed a BERA to evaluate risks to wildlife (such as small mammals, birds, and marine life) from exposure to soil. The BERA compared soil data against toxicity benchmarks for selected ecological receptors. Results of the risk evaluation indicated carnivorous birds (such as the American kestrel) and small omnivorous mammals (such as the house mouse) may be at risk from ingested doses of copper, lead, and PCBs at Parcel E (PCBs are not a COC in Parcel UC-3). However, the magnitude of the hazard quotient (all less than 2.7) and the low quality of the habitat suggest that risk is not significant. No unacceptable risk to ecological receptors was indicated at Parcel UC-3.

2.5.3 Basis for Response Action

The response action selected in this ROD is necessary to protect the public health, welfare, or the environment from actual or potential releases of hazardous substances into the environment. The Navy, in partnership with USEPA, DTSC, and RWQCB, considered all pertinent factors in accordance with CERCLA and NCP remedy selection criteria and determined that remedial action is necessary to clean up soil and groundwater at Parcel UC-3. This determination was made because chemicals were detected in soil and groundwater at concentrations that pose unacceptable risk to human health (cancer risk greater than 1 in 1,000,000 or a noncancer HI greater than 1).

The HHRA identified COCs in soil and groundwater present at concentrations that posed an unacceptable cancer risk or noncancer hazard. The elevated concentrations of COCs in soil were found to be located in noncontiguous areas of Parcel UC-3. The Navy identified an approach that proposed removal of soil areas that posed the most significant risk to humans, identified as hot spots in Figure 7, and proposed cover for the soil areas within Redevelopment Block MU-3 that posed a lower risk to humans (see Section 2.8.1).

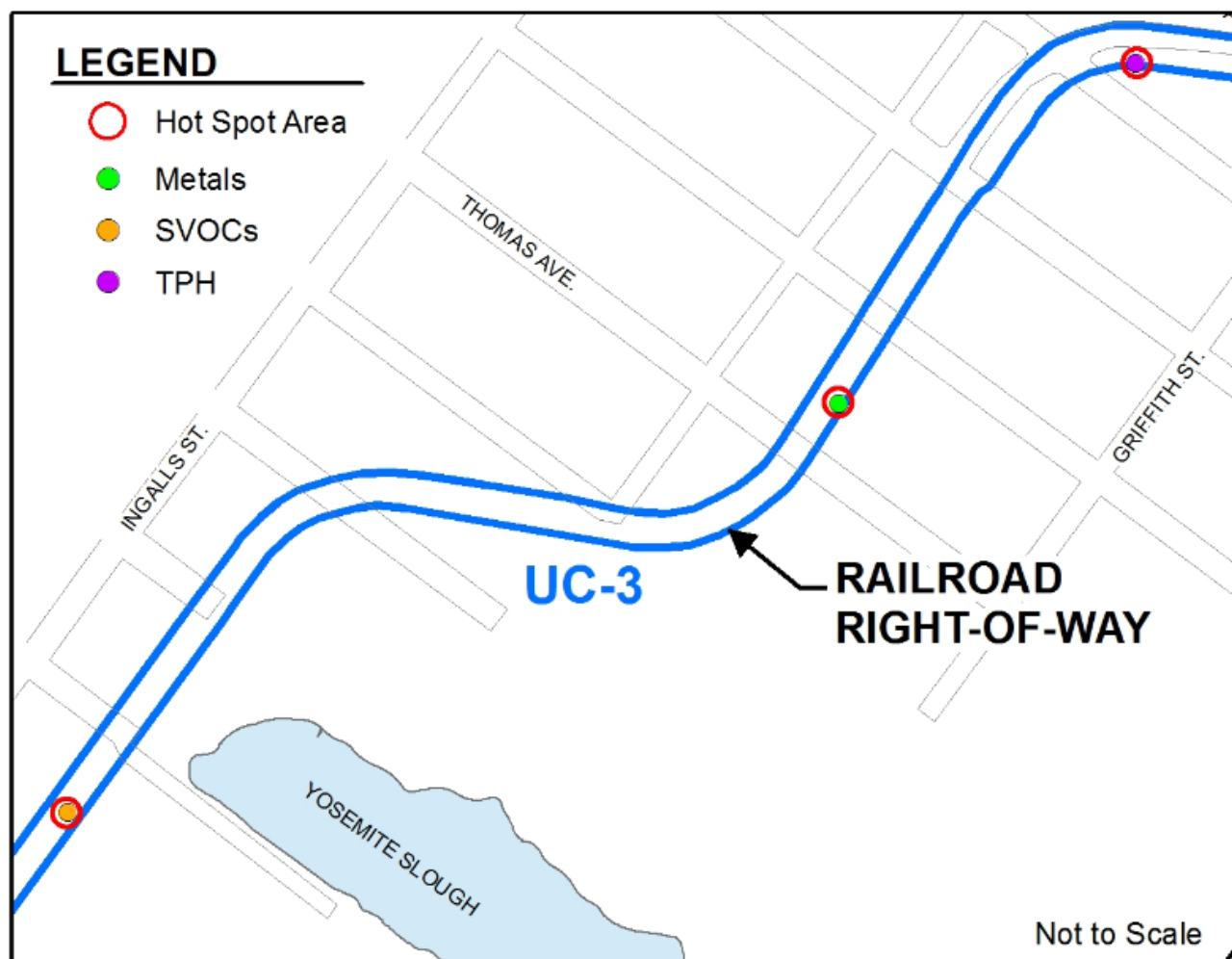


Figure 7. Tier 2 and TPH Hot Spot Locations in Soil

During the process of identifying potential areas for soil removal, the Navy focused the list of COCs to those nonradioactive chemicals present at concentrations that exceeded the RGs, which generally correspond to a cancer risk of 1 in 1,000,000 or a noncancer HI greater than 1. Areas in soil that contain elevated COC concentrations that pose the most significant risk to humans are referred to as hot spots. Hot spot locations were initially categorized as Tier 1 (COCs at concentrations greater than 10 times the RGs) or Tier 2 (COCs at concentrations greater than 5 times the RGs).

Additionally, TPH hot spot locations were defined as soil that contains TPH at concentrations greater than the RG. Figure 7 identifies the locations of Tier 2 and TPH hot spots in the railroad right-of-way. Table 6 identifies the COCs at the Tier 2 and TPH hot spots, along with residential RGs and Tier 2 and TPH action levels for each COC. For groundwater, the Navy proposed anaerobic in situ bioremediation (ISB), followed by monitored natural attenuation (MNA) (Section 2.8.1), and ICs in the IR Site 56 plume area. Figure 4 identifies the location of the IR Site 56 plume.

TABLE 6

Chemicals of Concern and Action Levels for Soil at Hot Spots in Railroad Right-of-Way

COC	Residential Remediation Goal (mg/kg)	Tier 2/TPH Hot Spot Action Levels (mg/kg)	Basis for Hot Spot Action Level
Benzo(a)anthracene	0.37	1.85	5 times the RG for residential exposure scenario ^a
Benzo(a)pyrene	0.33	1.65	5 times the RG for residential exposure scenario ^a
Benzo(b)fluoranthene	0.34	1.70	5 times the RG for residential exposure scenario ^a
Benzo(k)fluoranthene	0.34	1.70	5 times the RG for residential exposure scenario ^a
Copper	160	800	5 times the RG for residential exposure scenario ^a
Dibenz(a,h)anthracene	0.33	1.65	5 times the RG for residential exposure scenario ^a
Indeno(1,2,3-cd)pyrene	0.35	1.50	5 times the RG for residential exposure scenario ^a
Lead	155	755	5 times the RG for residential exposure scenario ^a
Total TPH	3,500	3,500	TPH source criterion ^b

Notes:

^a RGs for residential, industrial worker, construction worker, and recreational exposure scenarios are detailed in Table 7.^b The TPH source criterion represents the most conservative evaluation criterion for potential sources of groundwater contamination that may affect aquatic life in San Francisco Bay.

2.6 Principal Threat Waste

According to USEPA's "Guide to Principal Threat and Low Level Threat Wastes," principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The chemicals, found in soil and groundwater at Parcel UC-3, do not constitute a principal threat because the chemicals do not migrate readily in the environment.

2.7 Remedial Action Objectives

RAOs are established based on attainment of regulatory requirements, standards, and guidance; contaminated media; COCs and chemicals of ecological concern; potential receptors and exposure scenarios; and human health and ecological risks. Ultimately, the success of a remedial action is measured by its ability to meet the RAOs. Planned future land use is an important component in developing RAOs, and the RAOs for Parcel UC-3 are based on future mixed use and light industrial reuse.

The RAOs for Parcel UC-3 were developed in conjunction with the regulatory agencies and are listed by medium.

2.7.1 Soil and Soil Gas RAOs

Soil and soil gas RAOs for Parcel UC-3 are as follows:

- Prevent unacceptable exposure of humans to chemicals and radionuclides in soil at concentrations exceeding the RGs (Table 7) for the following exposure pathways:
 - Ingestion of, outdoor inhalation of, and dermal exposure to soil from 0 to 10 feet bgs by residents in areas zoned for mixed-use reuse.
 - Ingestion of homegrown produce in native soil in areas zoned for mixed-use reuse.
 - Ingestion of, outdoor inhalation of, and dermal exposure to soil from 0 to 10 feet bgs by construction workers in all areas.
 - Ingestion of, outdoor inhalation of, and dermal exposure to soil from 0 to 10 feet bgs by industrial users of the railroad right-of-way.
- Prevent exposure of humans to VOCs in soil gas at concentrations that would pose unacceptable risk via indoor inhalation of vapors. **Table 7 of the final soil gas memorandum** lists risk-based action levels for various volatile chemicals, including SVOCs, that may pose an unacceptable risk via indoor inhalation of vapors. These soil gas action levels will be used for an initial risk-based screening of data collected during future soil gas surveys (such as the surveys to be performed at the IR Site 56 VOC groundwater plume following active treatment). After the initial risk-based screening, areas with unacceptable risk will be further evaluated using location-specific data (i.e., physical characteristics of the soil) to assess potential exposures consistent with the State of California and USEPA vapor intrusion guidance. In addition, risks and hazards at these areas will be further characterized using the accepted methodology for risk assessments at HPNS.

2.7.2 Radiologically Impacted Media RAO

The RAO for radiologically impacted media for Parcel UC-3 is as follows:

- Prevent exposure to radiological isotopes at activity levels that exceed remediation goals for all potentially complete exposure pathways (which include external exposure, ingestion, and inhalation of soil based on the CSM for human health).

The RAO for radiologically impacted media has been satisfied through removal actions at Parcel UC-3. Excavation of radiologically impacted sewer and storm drain lines was completed under a TCRA in 2011. The removal action included all sewer and storm drain lines as well as potentially impacted soil. A Radiological RACR for Parcel UC-3 was submitted on March 16, 2012, and received concurrence for radiological unrestricted release from DTSC on October 31, 2012. All work required by the selected radiological remedy, Alternative R-2, has been completed and no additional actions are required. Selection of Alternative R-2 is documented in this ROD.

2.7.3 Groundwater RAOs

Groundwater RAOs for Parcel UC-3 are as follows:

- Prevent or minimize unacceptable exposure of humans to COCs in the B-aquifer at concentrations exceeding RGs via the domestic use pathway.

- Prevent or minimize unacceptable exposure of construction workers to VOCs in A-aquifer groundwater by dermal exposure and inhalation of vapors with chemicals exceeding RGs.

Table 7 lists the RGs for COCs in soil. Table 8 lists the RGs for COCs in groundwater.

TABLE 7
Remediation Goals for Soil

Chemical of Concern	RG for Residential Exposure Scenario (mg/kg)	RG for Industrial Worker Exposure Scenario (mg/kg)	RG for Construction Worker Exposure Scenario (mg/kg)	RG for Recreational Exposure Scenario (mg/kg)
Antimony	10	--	120	--
Aroclor 1260	0.21	--	2.1	0.74
Arsenic	11.1	11.1	11.1	11.1
Benzene	0.18	--	9.4	--
Benzo(a)anthracene ¹	0.37	1.8	6.4	1.3
Benzo(a)pyrene ¹	0.33	0.33	0.65	0.33
Benzo(b)fluoranthene ¹	0.34	1.8	6.5	1.3
Benzo(k)fluoranthene ¹	0.34	1.8	6.5	1.3
Bis(2-ethylhexyl)phthalate	1.1	--	--	--
Cadmium	3.5	--	--	--
Copper ¹	160	76,000	11,000	470
Dibenz(a,h)anthracene ¹	0.33	0.33	1.1	0.33
Heptachlor epoxide	0.0017	--	--	0.21
Indeno(1,2,3-cd)pyrene ¹	0.35	1.8	6.5	1.3
Iron	58,000	--	93,000	--
Lead ¹	155	800	800	155
Manganese	1,431	--	6,900	2,430
Mercury	2.28	--	93	210
Thallium	5.0	--	--	--
Vanadium	117	--	310	--
Zinc	370	--	--	--
Xylene	270	--	--	--
Total TPH ¹	3,500	3,500	3,500	3,500

Notes:

The source of the RG is presented in Table 3-1 of the Parcel E FS Report.

¹These chemicals are those found in soil at concentrations that exceed Soil Action Levels identified in Table 6.

TABLE 8
Remediation Goals for Groundwater

Exposure Scenario	Chemical of Concern	RG (µg/L)
Construction Worker Exposure to Shallow Groundwater (A-aquifer)	Trichloroethene	370
Construction Worker Exposure to Shallow Groundwater (A-aquifer)	1,2-dichloroethene (total)	305
Construction Worker Exposure to Shallow Groundwater (A-aquifer)	Vinyl chloride	6.3

Notes:

Trichloroethene is the only COC for groundwater in Parcel UC-3.

The source of the RGs is risk-based and presented in Section 3.1.3.2 and Table 3-3 of the Parcel E FS Report.

µg/L = microgram per liter

2.8 Description and Evaluation of Remedial Alternatives

The Navy screened a range of general response actions and remedial technologies and then, using the retained technologies, developed alternatives in the Parcel E FS Report to address contamination at Parcel UC-3.

2.8.1 Description of Remedial Alternatives

The following remedial alternatives evaluated for soil at Parcel UC-3 are listed and briefly described below:

- **Alternative S-1 – No Action:** Under Alternative S-1, no response action would be taken. Soil at Parcel UC-3 would be left in place as is, without implementing any ICs, containment, removal, treatment, or other response actions. The no action alternative is retained throughout the FS process as required by NCP to provide a baseline for comparison with and evaluation of other alternatives.
- **Alternative S-2 – Covers and Institutional Controls:** Alternative S-2 includes (1) covers at Redevelopment Block MU-3 to prevent unacceptable human exposure to ubiquitous metals and other COCs that may pose a risk, (2) ICs that would be implemented through deed restrictions, including maintaining the covers, (3) cleaning and closure of buried steam lines (IR Site 45), and (4) soil-gas monitoring at the IR Site 56 plume area.
- **Alternative S-3 – Excavation and Offsite Disposal of Soil from Tier 1 Locations, Followed by Covers and Institutional Controls:** Alternative S-3 includes (1) excavation and offsite disposal of soil from Tier 1 locations (soil that contains COCs at concentrations greater than 10 times the RGs) at a permitted facility, (2) covers at Redevelopment Block MU-3 and ICs to limit unacceptable exposure to COCs in soil that is left in place, (3) cleaning and closure of buried steam lines, and (4) soil-gas monitoring at the IR Site 56 plume area.
- **Alternative S-4 – Excavation and Offsite Disposal of Soil from Tier 2 and TPH Locations, Followed by Covers and Institutional Controls:** Alternative S-4 consists of (1) excavation and offsite disposal of soil from Tier 2 locations (soil that contains COCs at concentrations greater than 5 times the RGs) and TPH locations (soil that contains TPH at concentrations greater than the RG) at a permitted facility, (2) covers at Redevelopment Block MU-3 and ICs to limit

unacceptable exposure to COCs in soil that is left in place, (3) cleaning and closure of buried steam lines, and (4) soil-gas monitoring at the IR Site 56 plume area.

The following remedial alternatives for groundwater at Parcel UC-3 were developed for evaluation:

- **Alternative GW-1 – No Action:** Under Alternative GW-1, no response action would be taken. Groundwater at Parcel UC-3 would be left as is, without implementing any ICs, containment, removal, treatment, or other response actions.
- **Alternative GW-2 – Long-term Groundwater Monitoring and Institutional Controls:** Alternative GW-2 would meet RAOs by controlling exposure pathways through ICs. This alternative does not intend to restore affected groundwater for beneficial use. Long-term groundwater monitoring would provide awareness of the size and behavior of the COC plume, helping to ensure that contaminants do not migrate beyond controlled areas. ICs would be implemented in areas where humans could be exposed to COCs at concentrations that pose an unacceptable health risk.
- **Alternative GW-3 – In Situ Bioremediation, Monitored Natural Attenuation, and Institutional Controls:** Alternative GW-3 would meet RAOs by addressing organic chemicals through anaerobic ISB. Groundwater would be monitored during the ISB and natural attenuation phases of this alternative. ICs would be implemented in areas where humans could be exposed to COCs at concentrations that pose an unacceptable health risk.

The following remedial alternatives for radiologically impacted media at Parcel UC-3 were developed for evaluation:

- **Alternative R-1 – No Action:** Under Alternative R-1, no response action would be taken. Radiologically impacted sewer and storm drain lines at Parcel UC-3 would be left in place as is, without implementing any ICs, containment, removal, treatment, or other response actions. The no action alternative is retained throughout the FS process as required by NCP to provide a baseline for comparison with and evaluation of other alternatives.
- **Alternative R-2 – Survey, Removal, and Disposal:** Under Alternative R-2, all sewer and storm drain lines would be excavated. Excavated materials would be disposed of at offsite facilities. Surveys would then be conducted to ensure that RGs are met for radiological unrestricted release.

Alternative R-2 was completed as part of the basewide radiological TCRA. DTSC concurred on radiological unrestricted release for radiologically impacted media at Parcel UC-3 in October 2012.

Table 9 describes the major components and cost of each remedial alternative identified for Parcel UC-3. The Parcel E Feasibility Study presented costs for all of Parcel E, including Parcel UC-3. Parcel UC-3 is a small portion of the total cost for Parcel E. Cost estimates in this ROD were derived using a ratio of the soil volumes and groundwater plume area size in Parcel UC-3 to the overall Parcel E costs. Costs were not broken down by capital costs and operation and maintenance costs, as this was not identified in the FS specifically for Parcel UC-3.

TABLE 9

Remedial Alternatives Identified for Parcel UC-3

Remedial Alternative and Key Components		Cost
SOIL		
S-1	No Action: No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives.	\$0
S-2	<p>Covers: Construct physical barriers at Redevelopment Block MU-3 to eliminate the exposure pathways to soil at Parcel UC-3.</p> <p>Long-term Monitoring and Maintenance: Regularly inspect, maintain, and repair the existing covers.</p> <p>ICs: Impose ICs to limit the use of land or restrict activities.</p> <p>Steam Line Closure: Remove steam line if contaminated with waste oil, or clean and close steam line in place.</p> <p>Soil-gas Monitoring: Perform soil-gas monitoring at the IR Site 56 plume.</p>	<p>Capital Cost: \$250,000</p> <p>Total O&M: \$86,000</p> <p>Present Net Worth: \$358,000 (2.7% discount rate)</p> <p>Timeframe: 32 years</p>
S-3	<p>Excavation and Offsite Disposal of Soil from Tier 1 Locations: At Tier 1 locations, remove soil that contains chemicals at concentrations greater than 10 times the RGs.</p> <p>Covers: Construct physical barriers at Redevelopment Block MU-3 to eliminate the exposure pathways to soil at Parcel UC-3.</p> <p>Long-term Monitoring and Maintenance: Regularly inspect, maintain, and repair the existing covers.</p> <p>ICs: Impose ICs to limit the use of land or restrict activities.</p> <p>Steam Line Closure: Remove steam line if contaminated with waste oil, or clean and close steam line in place.</p> <p>Soil-gas Monitoring: Perform soil-gas monitoring at the IR Site 56 plume.</p>	<p>Capital Cost: \$452,000</p> <p>Total O&M: \$104,000</p> <p>Present Net Worth: \$611,000 (2.7% discount rate)</p> <p>Timeframe: 32 years</p>
S-4	<p>Excavation and Offsite Disposal of Soil from Tier 2 and TPH Locations, Followed by Covers and Institutional Controls: At Tier 2 locations, remove soil that contains chemicals at concentrations greater than 5 times the RGs (Tier 2 locations include Tier 1 locations). At TPH locations, remove soil that contains TPH at concentrations greater than the RG.</p> <p>Covers: Construct physical barriers within Redevelopment Block MU-3 to eliminate the exposure pathways to soil at Parcel UC-3.</p> <p>Long-term Monitoring and Maintenance: Regularly inspect, maintain, and repair the existing covers.</p> <p>ICs: Impose ICs to limit the use of land or restrict activities.</p> <p>Steam Line Closure: Remove steam line if contaminated with waste oil, or clean and close steam line in place.</p> <p>Soil-gas Monitoring: Perform soil-gas monitoring at the IR Site 56 plume.</p>	<p>Capital Cost: \$467,000</p> <p>Total O&M: \$104,000</p> <p>Present Net Worth: \$629,000 (2.7% discount rate)</p> <p>Timeframe: 32 years</p>

TABLE 9

Remedial Alternatives Identified for Parcel UC-3

Remedial Alternative and Key Components		Cost
RADIOLOGICALLY IMPACTED MEDIA		
R-1	No Action: No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives.	\$0
R-2	Survey, Removal, and Disposal: Excavate all sewer and storm drain lines. Excavated materials would be disposed of at offsite facilities. Surveys would then be conducted to ensure that RGs are met for radiological unrestricted release (see note below).	\$6,882,000
GROUNDWATER		
GW-1	No Action: No actions or costs; this alternative is required by CERCLA as a baseline for comparison with the other alternatives.	\$0
GW-2	Groundwater Monitoring: Implement long-term monitoring of groundwater to assess whether chemicals are migrating and to monitor changes in ambient conditions. ICs: Impose ICs to limit the use of land or restrict activities.	Capital Cost: \$16,000 Total O&M: \$164,000 Present Net Worth: \$150,000 (2.7% discount rate) Timeframe: 32 years
GW-3	In Situ Groundwater Treatment: Inject an organic compound at the source of groundwater contamination to stimulate biological activity to create conditions where VOCs are broken down into inert chemicals in groundwater. MNA: Implement long-term monitoring and studies of groundwater to assess whether chemicals are migrating and to evaluate the effects of treatment. ICs: Impose ICs to limit the use of land or restrict activities.	Capital Cost: \$67,000 Total O&M: \$221,000 Present Net Worth: \$259,000 (2.7% discount rate) Timeframe: 32 years

Notes:

Costs indicated above are based on calculated costs from the Parcel E FS Report and were estimated using unit costs for each remedial technology.

Alternative R-2 was completed as part of the basewide TCRA. The cost listed for Alternative R-2 is the approximate actual cost and includes removal and disposal actions, confirmation sampling, and completion of the RACR.

2.8.2 Comparative Analysis of Alternatives for Soil and Radiologically Impacted Media

This section presents a comparative analysis of alternatives for soil and radiologically impacted media with respect to the **nine evaluation criteria**: two threshold, five balancing, and two modifying criteria. Table 10 provides a relative ranking of the alternatives for soil. Table 11 provides a relative ranking of the alternatives for radiologically impacted media.

TABLE 10

Relative Ranking of Remedial Alternatives for Soil

CERCLA Criteria	Alternative S-1 No Action	Alternative S-2 Covers and ICs	Alternative S-3 Excavation and Offsite Disposal of Soil from Tier 1 Locations, Followed by Covers and ICs	Alternative S-4* Excavation and Offsite Disposal of Soil from Tier 2 and TPH Locations, Followed by Covers and ICs
Threshold Criteria				
Overall Protection of Human Health and Environment	No	Yes	Yes	Yes
Compliance with ARARs	NA	Yes	Yes	Yes
Balancing Criteria				
Long-term Effectiveness and Performance				
Reduction in Toxicity, Mobility, or Volume through Treatment				
Short-term Effectiveness				
Implementability				
Present Worth Cost	0	\$358,000	\$611,000	\$629,000
Modifying Criteria				
State Acceptance				
Community Acceptance ^a				

Notes:













Fill symbol by quarters from open (poor) to full (excellent).

* Indicates preferred alternative

^a Community Acceptance ranking of the alternatives was based on feedback received during community and public meetings and public comments on Parcels E and UC-3.

TABLE 11

Relative Ranking of Remedial Alternatives for Radiologically Impacted Media

CERCLA Criteria	Alternative R-1 No Action	Alternative R-2 ^a Survey, Removal, and Disposal
Threshold Criteria		
Overall Protection of Human Health and the Environment	No	Yes
Compliance with ARARs	NA	Yes
Balancing Criteria		
Long-term Effectiveness and Performance		
Reduction in Toxicity, Mobility, or Volume through Treatment		
Short-term Effectiveness		
Implementability		
Present Worth Cost	\$0	\$6,882,000
Modifying Criteria		
State Acceptance		
Community Acceptance ^b		

Notes:

Fill symbol by quarters from open (poor) to full (excellent).

Alternative R-2 was completed as part of the basewide TCRA. The cost listed for alternative R-2 is the approximate actual cost and includes removal and disposal actions, confirmation sampling, and completion of the RACR.

^a Indicates preferred alternative

^b Community Acceptance ranking of the alternatives was based on feedback received during community and public meetings and public comments on Parcels E and UC-3.

Following is a discussion that weighs the soil and radiologically impacted media alternatives against each other in terms of the threshold, balancing, and modifying criteria (nine evaluation criteria).

Threshold Criteria

Overall Protection of Human Health and the Environment. Alternatives S-2, S-3, S-4, and R-2 are protective. Alternatives S-1 and R-1 are not protective. Alternatives S-2, S-3, S-4, and R-2 protect human health and the environment under the anticipated future land use of Parcel UC-3. Alternatives S-1 and R-1 do not address any risks at the site; thus, they do not provide sufficient protection to human health or the environment.

Compliance with ARARs. Alternatives S-2, S-3, S-4, and R-2 comply with all of the pertinent ARARs, thereby satisfying this threshold criterion and making these alternatives eligible for selection as the final remedial action. ARARs do not apply to the no action alternatives.

Primary Balancing Criteria

Long-term Effectiveness and Permanence. Long-term effectiveness and permanence of Alternatives S-4 and R-2 are rated the highest because they would remove the most COC-contaminated soil and remove all radiologically impacted media. The magnitude of residual risks remaining after the response action would be highest for Alternative S-2, which relies on covers to meet the RAOs, and lowest for Alternatives S-3, S-4, and R-2, which implement excavations. Alternatives S-2, S-3, and S-4 would provide long-term effectiveness in meeting the RAOs through reliance on continual enforcement of deed restrictions to maintain covers and access restrictions. Alternative S-3 provides long-term effectiveness and permanence for soil contaminated with metals and organic chemicals but relies on a cover and ICs for other COCs. Alternative S-2 provides comprehensive soil coverage prior to development but does not permanently remove any contamination; long-term effectiveness is good for Alternative S-2, as long as the covers are maintained. Alternative R-2 provides long-term effectiveness through removal of all radiologically impacted media and a determination of radiological unrestricted release. Because no action would be taken under Alternatives S-1 and R-1, they do not provide any degree of long-term effectiveness.

Reduction in Toxicity, Mobility, and Volume through Treatment. Alternative S-4 would reduce both the mobility and volume of contaminated soil in a particular geographic area at the site, thus it is rated the highest (good). Alternatives S-1, S-2, S-3, R-1 and R-2 were all rated low (poor) because they do not include treatment that would result in the destruction, transformation, or irreversible reduction in contaminant mobility.

Short-term Effectiveness. Alternatives S-1 and R-1 have the least effect on the community, workers, or the environment during implementation because they include no actions, so they were rated higher for short-term effectiveness. Alternative S-2 would similarly introduce minimal risk to the community, workers, or the environment because it does not include significant amounts of excavation, hauling, and disposal of contaminated soil. Alternatives S-3, S-4, and R-2 include removing and hauling large volumes of soil with contamination, which would pose potential risk to site workers, the community, and the environment. However, this risk is considered low because mitigation measures would be implemented to protect human health and the environment. Alternatives S-2, S-3, and S-4 would generate similarly sized environmental footprints, primarily associated with emissions and energy use from construction of the durable covers; however, the periods of construction for all three alternatives are relatively short (2 years) and would not significantly affect short-term effectiveness. Therefore, Alternatives S-3 and S-4 were rated equally good with respect to short-term effectiveness.

Implementability. Alternatives S-2, S-3, and S-4 require implementation of ICs and active remediation. Installing covers and excavating soil (Alternatives S-3 and S-4) are standard technologies that are easy to implement and have been successfully implemented in the past at HPNS. However, the excavation operation decreases the implementability of Alternatives S-3, S-4, and R-2. Alternatives S-1 and R-1 do not involve remedial technologies or ICs because no implementation occurs.

Cost. Alternatives S-1 and R-1 require no action; therefore, no costs are associated with these alternatives. Alternative S-2 would incur relatively low costs (\$358,000) because it includes no active remediation prior to property transfer. Alternatives S-3 and S-4 would incur higher costs (\$611,000 for Alternative S-3 and \$629,000 for Alternative S-4) because they include excavation and

offsite disposal of contaminated soil as an option. No costs remain for Alternative R-2 because the TCRA is complete, and the site has achieved radiological unrestricted release.

Modifying Criteria



















State Acceptance. DTSC and RWQCB have been involved throughout the CERCLA process and concur with the selected remedies for Parcel UC-3.

Community Acceptance. Comments received from the public during the public meeting and during the public comment period for the Proposed Plan are addressed in the Responsiveness Summary.

2.8.3 Comparative Analysis of Alternatives for Groundwater

This section presents a comparative analysis of alternatives for groundwater with respect to the nine evaluation criteria: two threshold, five balancing, and two modifying criteria. Table 12 provides a relative ranking of the alternatives for groundwater.

TABLE 12
Relative Ranking of Remedial Alternatives for Groundwater

CERCLA Criteria	Alternative GW-1 No Action	Alternative GW-2 Long-term Groundwater Monitoring and ICs	Alternative GW-3* In Situ Bioremediation, Monitored Natural Attenuation, and ICs
Threshold Criteria			
Overall Protection of Human Health and Environment	No	No	Yes
Compliance with ARARs	NA	No	Yes
Balancing Criteria			
Long-term Effectiveness and Performance			
Reduction in Toxicity, Mobility, or Volume through Treatment			
Short-term Effectiveness			
Implementability			
Present Worth Cost	0	\$150,000	\$259,000
Modifying Criteria			
State Acceptance			
Community Acceptance ^a			

Notes:

Fill symbol by quarters from open (poor) to full (excellent).

* Indicates preferred alternative

^a Community Acceptance ranking of the alternatives was based on feedback received during community and public meetings and public comments on Parcels E and UC-3.

Following is a discussion that weighs the groundwater alternatives against each other in terms of the threshold, balancing, and modifying criteria (nine evaluation criteria).

Threshold Criteria

Overall Protection of Human Health and the Environment. Alternative GW-3 is protective of human health and the environment. Alternatives GW-1 and GW-2 are not protective of human health. Alternative GW-3 would accelerate the degradation of chemicals that would reduce the duration of implementation and the longevity of some ICs over time.

Compliance with ARARs. Alternative GW-3 complies with all of the pertinent ARARs, thereby satisfying this threshold criterion and making alternative GW-3 eligible for selection as the final remedial action. Alternative GW-2 does not meet all of the pertinent ARARs. ARARs do not apply to the no action alternative (GW-1).

Primary Balancing Criteria

Long-Term Effectiveness and Permanence. Alternative GW-3 would provide the highest level of long-term effectiveness and permanence because COCs would be degraded or immobilized using treatment technologies that have been successfully implemented at other HPNS sites. Alternative GW-2 would provide a poor level of long-term effectiveness and permanence because human health risk would be addressed only through ICs. Alternative GW-1 would not provide an acceptable level of long-term effectiveness and permanence.

Reduction in Toxicity, Mobility, and Volume through Treatment. Alternative GW-3 is rated the highest because it reduces the toxicity and/or mobility of COCs, as well as the volume of contaminated groundwater by active treatment of COCs through both aerobic and anaerobic degradation. Alternatives GW-1 and GW-2 would not reduce the toxicity or volume of chemicals, other than through the natural recovery of the aquifer.

Short-Term Effectiveness. Alternative GW-1 has an excellent short-term effectiveness rating because no response actions are conducted under this alternative. Alternative GW-3 poses a greater risk to workers than Alternative GW-2 because it involves more aggressive field activities that would expose receptors to additional risks. However, the risks associated with implementing Alternative GW-3 could be mitigated through control measures during the implementation period. Control measures have been implemented successfully at HPNS in the past and should not be considered a significant hindrance to Alternative GW-3. Alternative GW-3 would generate a moderately sized environmental footprint, primarily associated with emissions and energy from well drilling and groundwater treatment. Comparatively, Alternative GW-2 would produce a relatively small footprint because of the lack of construction-based field activity. Overall, none of the environmental footprints produced by these remedial alternatives would be considered large enough or would occur over a long enough period of time to be considered a hindrance to short-term effectiveness.

Implementability. Alternatives GW-1 and GW-2 have the highest rating because their implementation requires minimal to no construction. Alternative GW-3 is more complex to implement because it includes construction and implementation of in situ treatment technologies.

Cost. Alternative GW-1 requires no action; therefore, no costs are associated with this alternative. Alternative GW-2 would incur low costs (\$150,000) because it includes no active remediation. Alternative GW-3 would incur higher costs (\$259,000) because it includes construction and implementation of specialized treatment technologies.

Modifying Criteria

State Acceptance. DTSC and RWQCB have been involved throughout the CERCLA process and concur with the selected remedy for Parcel UC-3.

Community Acceptance. Community acceptance is evaluated based on comments received from the public during the public comment period for the Proposed Plan. The Proposed Plan, which identified Alternatives S-4, GW-3, and R-2 as the preferred remedial alternatives, was presented to the community and discussed during a public meeting on February 28, 2013. Comments were also gathered during the public comment period from February 13 through April 1, 2013. In general, public comments expressed support for the Navy's selected remedial alternatives. Attachment 3, the responsiveness summary of this ROD, addresses the public's comments and specific concerns about the selected remedial alternatives for soil in the railroad right-of-way (Alternative S-4), for groundwater at the IR Site 56 plume (Alternative GW-3), and for radiologically impacted media at Parcel UC-3 (Alternative R-2). Section 2.10 provides additional information on the Navy's community participation efforts for Parcel UC-3.

2.9 Selected Remedy

2.9.1 Rationale for Selected Remedy

The selected remedy for Parcel UC-3 consists of the following:

- Soil – Alternative S-4. Excavation and offsite disposal of soil from Tier 2 and TPH locations (Figure 7), followed by covers within Redevelopment Block MU-3, steam line closure, and ICs. Soil gas surveys will be conducted in consultation with regulatory agencies (1) in focused areas where concerns continue about residual VOCs in soil, (2) where VOCs are present in groundwater, (3) at groundwater remediation areas following completion of the remedial action for groundwater, and (4) to evaluate the need for remedial action or the reduction or retention of an Area Requiring Institutional Control (ARIC) for potential VOC chemicals in groundwater and soil gas.
- Groundwater – Alternative GW-3. ISB, MNA, and ICs (Figure 4).
- Radiologically Impacted Media – Alternative R-2. Survey, removal, and disposal.

The Navy and USEPA, in consultation with DTSC and RWQCB, selected the remedy based on an evaluation of the remedial alternatives, as described in Section 2.8, relative to the nine evaluation criteria. The selected remedies comply with the two threshold criteria and provide the best balance among the alternatives with respect to the five balancing criteria. The Navy's evaluation of the two modifying criteria did not warrant changes to the preferred alternatives published in the Proposed Plan.

Alternative S-4 will achieve RAOs by permanently removing soil in selected areas where chemicals exceed 5 times the RGs (Tier 2 locations, including Tier 1 locations) or the RG (TPH locations), thus protecting human health under the anticipated future land use of Parcel UC-3. Alternative S-4

prevents exposure to contaminants remaining in soil by durable covers. Alternative S-4 also provides long-term effectiveness in meeting the RAOs through reliance on continual enforcement of deed restrictions to maintain covers and access restrictions, and control of future land uses.

Alternative GW-3 will achieve RAOs by actively treating the VOC groundwater plume at Parcel UC-3 using injected biological nutrients to break down the VOCs to nontoxic compounds. The Navy expects that it will take several years to complete the active treatment, which will be followed by MNA to ensure that natural processes are degrading the remaining VOCs. The Navy will also implement ICs after these activities for continued protection of public health and the environment and to ensure the integrity of the containment remedies.

All work required by the selected radiological Alternative R-2 has been completed and no additional actions are required.

2.9.2 Description of Selected Remedy

The selected remedy for soil and groundwater at Parcel UC-3 consists of two primary components: (1) excavation and offsite disposal of soil from Tier 2 and TPH locations, steam line closure, and soil-gas monitoring at the IR Site 56 plume, followed by covers within Redevelopment Block MU-3 and ICs; and (2) ISB, MNA, and ICs at the IR Site 56 plume. The following sections describe the components of the selected remedy, which will be **further developed in the Remedial Design (RD)**.

2.9.2.1 Excavation and Offsite Disposal (Alternative S-4)

Alternative S-4 consists of removing soil from three locations that pose an unacceptable risk to humans and the environment, with disposal at one or more approved offsite landfills, as appropriate, and backfilling of the excavations with clean soil.

In the Parcel E FS, areas to be excavated were identified. The extents of the excavations are based on data collected during characterization efforts in 2012 and the industrial screening criteria used in the Revised Parcel E RI. The three excavations in Parcel UC-3 are shown on Figure 8 and defined as follows:

- Excavation EX52B009 is located where SVOC concentrations exceeded Tier 2 action levels at soil boring IR52B009. The total proposed excavation area is approximately 1,103 square feet, and the total volume to be excavated to 5 feet bgs is approximately 204 yd³ of soil.
- Excavation EX52SS02 is located where TPH concentrations exceeded the TPH action level at soil boring PA52SS02. The total proposed excavation area is approximately 694 square feet, and the total volume to be excavated to 3 feet bgs is approximately 77 yd³ of soil.
- Excavation EX52SS06 is located where copper and lead concentrations exceeded Tier 2 action levels at soil boring PA52SS06. The total proposed excavation area is approximately 1,097 square feet, and the total volume to be excavated to 3 feet bgs is approximately 122 yd³ of soil.

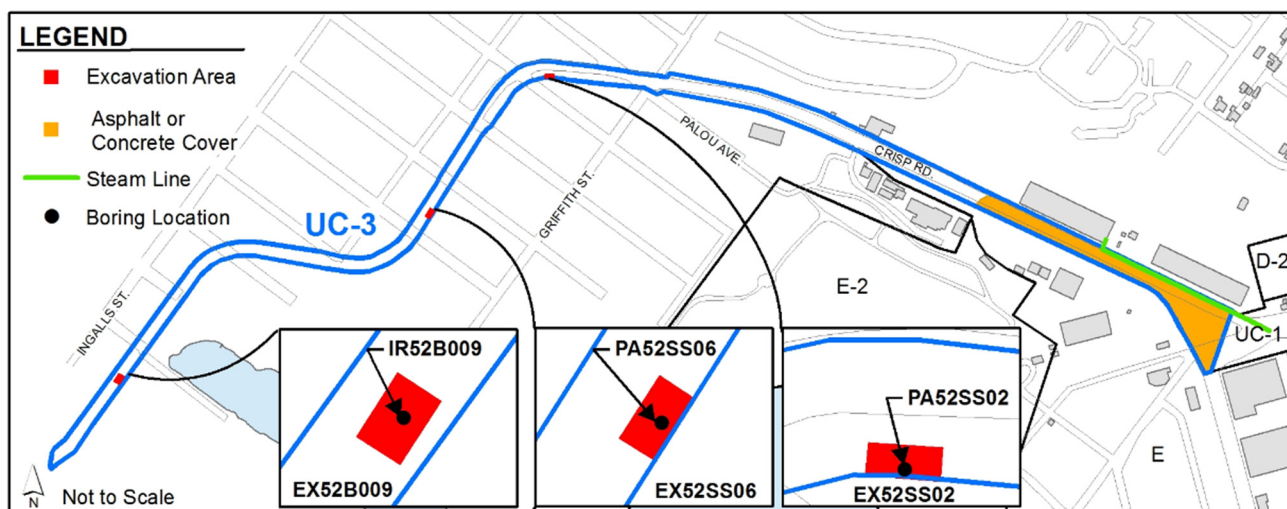


Figure 8. Excavation and Cover Plan

Following excavation and before the voids are backfilled, confirmation samples will be collected for analysis to verify that soil Tier 2 and TPH action levels (Table 6) have been achieved at each soil excavation area. Following receipt of acceptable confirmation sampling results, the excavations will be backfilled with clean imported soil that meets acceptance criteria (to be specified in the RD) and compacted.

2.9.2.2 Durable Covers (Alternative S-4)

A durable cover is required at Parcel UC-3 in the eastern portion of Crisp Road (specifically within Redevelopment Block MU-3) to meet the RAO by breaking the exposure pathway for contamination left in place. Durable covers are not required in the railroad right-of-way and the area between the railroad right-of-way and Redevelopment Block MU-3.

Soil and groundwater in this area are not contaminated above the RGs for the industrial worker exposure scenario, except for the hot spot locations in the railroad right-of-way, which will be excavated. A durable cover will not break, erode, or deteriorate such that the underlying soil becomes exposed. The durable cover will consist of a minimum of 4 inches of asphalt or concrete paving. Existing asphalt and concrete surfaces and buildings may be used as covers as long as they meet the durability requirement. Asphalt covers will be sealed at the start of construction and maintained by resealing once every 10 years or as needed to prevent opening an exposure pathway.

2.9.2.3 Steam Line Closure (Alternative S-4)

Additional investigation of the underground stream line system (IR Site 45) will be required to assess whether individual steam lines within Parcel UC-3 were used to transfer waste oil and if so, whether they leaked into the concrete utility corridors. A general procedure was provided in the Parcel E FS for steam line investigation and closure, including:

- Geophysical mapping of pipelines
- Asbestos abatement of protective wrap and pipe insulation
- Inspection and tightness testing of steam lines, with excavation to expose steam lines as needed
- Sampling and analysis of fluids or, if none, wipe sampling to identify pipe segments with potential impact to soil and groundwater

- Pressure testing of pipeline segments where waste oil and contaminants were found
- Removal of pipeline segments that fail pressure testing
- Pressure washing of remaining pipeline segments and confirmatory wipe sampling
- Utility corridor cleaning and inspection with excavation

Detailed excavation and confirmation sampling plans will be developed in the RD. If soil samples are collected as part of the steam line closure activities, they will be compared to Tier 2 and TPH action levels (Table 6) to determine whether remediation is required.

2.9.2.4 Excavation and Offsite Disposal of Radiologically Impacted Sewer and Storm Drain Lines (Alternative R-2)

Alternative R-2 will achieve RAOs by performing the following actions: (1) scanning radiologically impacted sewer and storm drain lines at Parcel UC-3; (2) screening, separating, and disposing of radiologically impacted debris and soil at an approved landfill; and (3) performing final surveys to demonstrate RGs have been met. As discussed in Sections 1.1 and 2.8.1, this alternative was completed at Parcel UC-3 under a TCRA in 2011. All work required by the selected radiological Alternative R-2 has been completed and no additional actions are required. A Radiological RACR was submitted on March 16, 2012, and received concurrence for radiological unrestricted release from DTSC on October 31, 2012.

2.9.2.5 In Situ Bioremediation (Alternative GW-3)

ISB: Anaerobic ISB will be used for the IR Site 56 plume to target TCE. Reductive dechlorination is the mechanism by which chlorinated compounds are biodegraded into less harmful constituents such as ethene and ethane. Anaerobic conditions will be produced by introducing a substrate (or food source). The substrate will fuel aerobic micro-organisms and cause them to quickly deplete available oxygen. Anaerobic micro-organisms will then multiply in the anoxic environment and destroy the targeted chemicals through a variety of mechanisms, including direct metabolism, co-metabolism, and halorespiration.

Hydrogen is a key component in anaerobic contaminant degradation during reductive dechlorination. Hydrogen release compound (HRC) is an electron donor that, when hydrated, is specifically designed to produce a controlled release of lactic acid. The resulting lactic acid is critical for the production of hydrogen to fuel anaerobic biodegradation processes in groundwater. Therefore, HRC acts as a reducing agent and a hydrogen-producing agent.

Substrate will be injected into the saturated zone of the A-aquifer within the lateral extent of the IR Site 56 plume. Once in the subsurface, HRC resides within the soil matrix fueling reductive dechlorination and promoting reducing aquifer conditions for periods of up to 24 months or longer through the controlled release of lactic acid and subsequent hydrogen production. The HRC dosages used to produce the cost estimates were modeled conservatively using the maximum plume concentration, so it is anticipated that only a single treatment will be required to achieve target endpoints at the plume (to be developed by the Navy and regulatory agencies during the RD). Based on maximum observed concentrations and half-lives of the target COC, it is estimated that anaerobic bioremediation will meet the intermediate remediation endpoints in about 2 years (based on professional judgment and past experience). ISB performance monitoring will continue until groundwater ROAs and RGs are met and no rebound is observed, even after depletion of amendments.

Quarterly progress monitoring will be conducted during the anaerobic phase (the 2-year active remediation period). Wells will also be monitored during the MNA phase, which is described in more detail in Section 2.9.2.6.

2.9.2.6 Monitoring

Soil-gas Monitoring (Alternative S-4)

IR Site 56, located partially within Parcel UC-3, will be evaluated as a potential soil gas survey area. Soil gas surveys will be conducted, in consultation with regulatory agencies, (1) in focused areas where concerns continue about residual VOCs in soil, (2) where VOCs are present in groundwater, (3) at groundwater remediation areas following completion of the remedial action for groundwater, and (4) to evaluate the need for remedial action or the reduction or retention of an ARIC for potential VOC chemicals in groundwater and soil gas.

Monitored Natural Attenuation (Alternative GW-3)

MNA will follow implementation of ISB. MNA will continue for as long as COC concentrations exceed their RGs or until a vapor intrusion risk evaluation determines that no unacceptable risk to future users exists. MNA is distinguished from long-term monitoring in that MNA measures and evaluates the natural processes that reduce chemical concentrations to acceptable levels (e.g., dilution, volatilization, biodegradation, adsorption, and chemical reactions with native soils); long-term monitoring is conducted to measure changes in chemical concentrations including byproducts (daughter compounds) of degradation. Where MNA is implemented, MNA parameters are monitored for, in addition to the COC monitoring prescribed by the long-term monitoring program. MNA parameters are collected to demonstrate that long-term biological degradation is occurring. If degradation is not demonstrated through site data, then the use of biological activity enhancers (such as electron acceptors, nutrients, and electron donors) may be required to enhance the MNA process.

2.9.2.7 Maintenance and Institutional Controls (Alternatives S-4 and GW-3)

Each of the selected remedies includes the monitoring and maintenance activities that will be performed as long as necessary to protect human health and the environment and to comply with the substantive provisions of pertinent state and federal ARARs (see Attachment D). In addition, the selected remedy will be subject to statutory reviews every 5 years pursuant to CERCLA to ensure that it remains protective of human health and the environment.

The Navy will also implement ICs, which are legal and administrative mechanisms for the continued protection of human health and the environment. In Parcel UC-3, the objectives of the ICs are as follows:

- Implement land use and activity restrictions that limit the exposure of future landowners or users of the property to hazardous substances present on the property and in groundwater.
- Ensure the integrity of the remedial action, including any current or future remedial or monitoring systems such as monitoring wells and subsurface groundwater control barriers.

ICs are required on a property where the selected remedial action results in contamination remaining at the property above levels that allow for unlimited use and unrestricted exposure. The ICs will restrict the development, land use, and activities on Parcel UC-3 property, as described in this ROD. These ICs will be maintained until the concentrations of hazardous substances in soil and groundwater are at levels that allow for unrestricted use and exposure. Implementation of ICs at

Parcel UC-3 includes requirements for monitoring, inspections, and reporting, to ensure compliance with land use or activity restrictions. Figure 9 presents the ARIC for chemicals, which comprises all of Parcel UC-3.

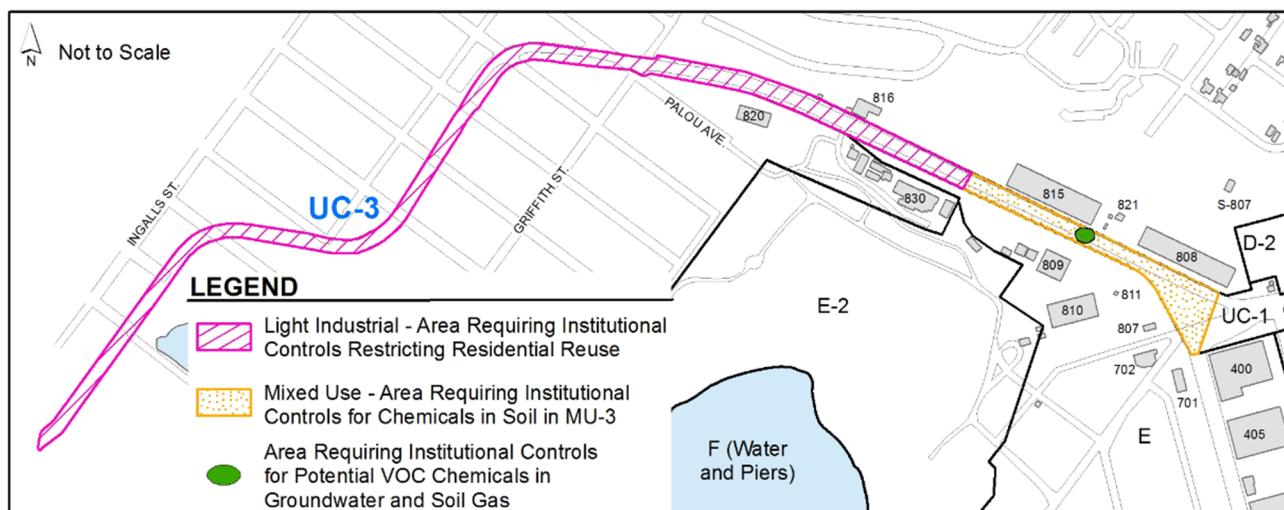


Figure 9. Area Requiring Institutional Controls (ARIC)

The Navy has determined that it will rely on proprietary controls in the form of environmental restrictive covenants as provided in the *Memorandum of Agreement Between the United States Department of the Navy and the California Department of Toxic Substances Control* and attached covenant models (Navy and DTSC, 2000) (hereinafter referred to as the Navy/DTSC MOA).

More specifically, land use and activity restrictions will be incorporated into two separate legal instruments as provided in the Navy/DTSC MOA:

1. Restrictive covenants included in one or more Quitclaim Deeds from the Navy to the property recipient.
2. Restrictive covenants included in one or more Covenant to Restrict Use of Property entered into by the Navy and DTSC as provided in the Navy/DTSC MOA and consistent with the substantive provisions of California Code of Regulations Title 22 § 67391.1.

The Covenants to Restrict Use of Property will incorporate the land use restrictions into environmental restrictive covenants that run with the land and that are enforceable by DTSC against future transferees. The Quitclaim Deeds will include the identical land use and activity restrictions in environmental restrictive covenants that run with the land and that will be enforceable by the Navy against future transferees.

The land use and activity restrictions in the Covenants to Restrict Use of Property and Quitclaim Deeds will be further defined in the land use control remedial design (LUC RD) report that will be prepared by the Navy and reviewed and approved by the other FFA signatories. The LUC RD report shall be referenced in the applicable Covenant to Restrict Use of Property and Deed. CCSF may prepare a risk management plan (RMP) to be approved by the FFA signatories that may set forth certain requirements and protocols used to conduct restricted activities.

In addition to being set forth in the Covenants to Restrict Use of Property and Quitclaim Deeds, restrictions applied to specified portions of the property will be described in findings of suitability to transfer.

Access: The Deed and Covenant shall provide that the Navy and other FFA signatories, where applicable, and their authorized agents, employees, contractors, and subcontractors have the right to enter upon HPNS Parcel UC-3 to conduct investigations, tests, or surveys; inspect field activities; or construct, operate, and maintain any response or remedial action as required or necessary under the cleanup program, including, but not limited to, monitoring wells, pumping wells, treatment facilities, and cover and containment systems.

Implementation: The Navy shall address and describe IC implementation and maintenance actions, including periodic inspections and reporting requirements in the preliminary and final RD reports to be developed and submitted to the FFA signatories for review pursuant to the FFA (see *Navy Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions* attached to January 16, 2004 United States Department of Defense memorandum titled *Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] Record of Decision [ROD] and Post-ROD Policy*). The preliminary and final RD reports are primary documents as provided in Section 7.3 of the FFA.

The Navy is responsible for implementing, maintaining, reporting on, and enforcing institutional controls. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity.

2.9.2.8 Activity Restrictions That Apply to Mixed Use Area 3

The following sections describe the IC objectives to be achieved through activity restrictions throughout Mixed Use Area 3 in order to ensure that necessary measures to protect human health and the environment and the integrity of the remedy have been undertaken.

Restricted Activities: The following restricted activities throughout Mixed Use Area 3 must be conducted in accordance with the Covenants to Restrict Use of Property, Quitclaim Deeds, the LUC RD report, and, if necessary, an RMP, and any other work plan or document approved in accordance with these referenced documents.

- a. Land-disturbing activity, which includes, but is not limited to, the following: (1) excavation of soil, (2) construction of roads, utilities, facilities, structures, and appurtenances of any kind, (3) demolition or removal of hardscape (e.g., concrete roadways, parking lots, foundations, and sidewalks), (4) any activity that involves movement of soil to the surface from below the surface of the land, and (5) any other activity that causes or facilitates the movement of known contaminated groundwater. Land-disturbing activities are not intended to include placement of additional clean, imported fill on top of the soil cover that the Navy will construct upon a portion of HPNS Parcel UC-3.
- b. Alteration, disturbance, or removal of any component of a response or cleanup action (including, but not limited to, pump-and-treat facilities and soil cap/containment systems); groundwater extraction, injection, and monitoring wells and associated piping and equipment; or associated utilities.
- c. Extraction of groundwater and installation of new groundwater wells.

- d. Removal of or damage to security features (e.g., locks on monitoring wells, survey monuments, fencing, signs, or monitoring equipment and associated pipelines and appurtenances).

Prohibited Activities: The following activities are prohibited throughout HPNS Parcel UC-3:

- e. Growing vegetables or fruits in native soil for human consumption.
- a. Use of groundwater.

2.9.2.9 Activity Restrictions Relating to VOC Chemicals at Specific Locations within Parcel UC-3

Any proposed construction and occupancy of enclosed structures within the ARIC must be approved by the FFA signatories in accordance with the Covenants to Restrict Use of the Property, Quitclaim Deeds, and LUC RD, to ensure that the risks of potential exposures to VOC vapors are reduced to acceptable levels that are adequately protective of human health. The ARIC for potential VOC chemicals in groundwater and soil gas shown on Figure 9 will include the portion of the ARIC that is located in Redevelopment Block MU-3 within Parcel UC-3. The reduction in potential risk can be achieved through engineering controls or other design alternatives that meet the specifications set forth in the ROD, RD reports, and LUC RD report. When construction of enclosed structures or reuse of an existing building is proposed in the ARIC, the FFA signatories must approve the design of the vapor control system built into foundations. In addition, enclosed structures within the ARIC shall not be occupied until the Owner has requested and obtained FFA Signatory approval that any necessary engineering controls or design alternatives have been properly constructed and are operating successfully. The ARIC for potential VOC chemicals in groundwater and soil gas may be modified by the FFA signatories when vapor inhalation risks for cancer (produced from soil contamination areas and groundwater contaminant plumes) are reduced to less than 1 in 1,000,000.

2.9.2.10 Additional Land Use Restrictions for Areas Designated for Industrial Reuse

For property areas designated for industrial land uses, the following land uses will be specifically prohibited unless written approval for such use is granted by the FFA signatories in accordance with the Covenants to Restrict Use of the Property, Quitclaim Deeds, and LUC RD report:

- a. A residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation.
- b. A hospital for humans.
- c. A school for persons under 21 years of age.
- d. A day care facility for children.

2.9.3 Expected Outcomes of the Selected Remedy

Once the selected remedy has been implemented, risk to human health and the environment under the planned mixed use and light industrial use will be acceptable and the RAOs will be achieved. Excavation and offsite disposal of soil from Tier 2 and TPH locations will reduce site risks, and the cover will prevent contact with remaining contamination that might pose an unacceptable risk. Steam line removal will reduce site risks by removing a potential source of contamination. Soil-gas monitoring will reduce risk uncertainty by evaluating the potential risk associated with vapor intrusion and determining the extent to which further monitoring, remediation, or ICs are required to mitigate vapor intrusion risk. ISB will reduce site risks by degrading contaminants during reductive

dechlorination to levels that do not pose an unacceptable risk. The selected remedy will take a relatively short period of time to implement and will use readily available technologies and labor. Following implementation, long-term monitoring and maintenance will ensure the continued protection of human health and the environment. In addition, ICs will restrict potential exposure to contaminated soil, soil-gas, and groundwater, and the restrictions will be consistent with the planned future use of Parcel UC-3.

2.9.4 Statutory Determinations

In accordance with the NCP, the selected remedy for Parcel UC-3 meets the following statutory determinations:

- **Protection of Human Health and the Environment.** The selected remedy will protect human health and the environment by preventing exposure to COCs through the excavation of soil from Tier 2 and TPH locations near the ground surface, installation of covers, closure of steam lines, monitoring of soil-gas, ISB, MNA, and implementation of ICs.
- **Compliance with ARARs.** CERCLA § 121(d)(1) states that remedial actions on CERCLA sites must attain (or the decision document must justify waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate. The selected remedy for Parcel UC-3 will comply with the substantive provisions of the federal and state requirements identified as ARARs. The chemical-, location-, and action-specific ARARs for the selected remedy are summarized in Attachment D.
- **Cost Effectiveness.** As specified in the NCP, the cost effectiveness of a remedy is determined in two steps. First, the overall effectiveness of a remedial alternative is determined by evaluating the following three of the five balancing criteria: (1) long-term effectiveness and permanence; (2) reduction in toxicity, mobility, or volume through treatment; and (3) short-term effectiveness. Second, the overall effectiveness is compared to cost to determine whether a remedy is cost effective. The selected alternatives have a high overall effectiveness because, compared to the other remedial alternatives, the selected alternatives offer a high degree of long-term effectiveness in a manner that minimizes short-term risks. The selected remedy will provide high overall effectiveness proportional to its costs, as demonstrated by the improved overall effectiveness of Alternatives S-4 and GW-3 relative to Alternatives S-3 and GW-2 for a modest incremental cost increase. Therefore, the selected remedy is considered cost effective. In contrast, Alternatives S-3 and GW-2 are not considered cost effective because of lower overall effectiveness. The selected remedy consists of the most cost effective alternatives and represents the most reasonable value for the money. The costs are proportional to overall effectiveness by achieving long-term effectiveness and permanence within a reasonable timeframe.
- **Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable.** The Navy has determined that the selected groundwater treatment remedy (Alternative GW-3), combined with excavation of three limited areas of contaminated soil (Alternative S-4), represents the maximum extent to which permanent solutions and treatment are practicable at this site. Alternatives S-4 and GW-3 provide a combination of removal and monitoring that reduces risk sooner, is easiest to implement, and provides additional risk reduction as compared with other Alternatives. The selected alternatives are the most permanent solutions, the most cost effective and represent the

most reasonable value for the money. The costs are proportional to overall effectiveness by achieving long-term effectiveness and permanence within a reasonable timeframe.

- **Preference for Treatment as a Principal Element.** The selected remedy for soil does not satisfy the statutory preference for treatment as a principal element because there is no cost-effective way to treat the noncontiguous areas that have low-level soil contamination in the railroad right-of-way of Parcel UC-3. Treatment is not a principal element of the selected remedy for soil because excavation and offsite disposal provide the best balance of tradeoffs with respect to long-term effectiveness and permanence in the shortest timeframe for a reasonable cost. However, treatment is the principal element of the selected remedy for groundwater because ISB is considered to have high, long-term effectiveness and permanence for a reasonable cost.
- **Five-Year Review Requirements.** Statutory five-year reviews pursuant to CERCLA § 121 and the NCP will be conducted because the selected remedy will leave contamination in place at Parcel UC-3 above levels that allow for unrestricted use and unlimited exposure. Five-year reviews for Parcel UC-3 will follow the ongoing schedule of five-year reviews established for other remedies in place at HPNS.

2.9.5 Documentation of Significant Changes

No significant changes were made to the ROD from the information presented in the Proposed Plan.

2.10 Community Participation

Community participation at HPNS includes public meetings, public information repositories, an IR Program website, newsletters and fact sheets, public notices, and site tours. The [Community Involvement Plan](#) for HPNS provides detailed information on community participation for the IR Program and documents interests, issues, and concerns raised by the community regarding ongoing investigation and cleanup activities at HPNS. The Navy held a community meeting on February 2, 2010, to solicit community input on updating the Community Involvement Plan for HPNS. The Navy used this input in preparing an update to the Community Involvement, which was finalized in May 2011.

Starting in January 2010, the Navy began conducting bimonthly Community Technical Meetings to discuss the technical aspects of the CERCLA milestone documents with community members (and with participation from the Base Realignment and Closure [BRAC] Cleanup Team). Documents and relevant information relied upon in the remedy selection process are made available for public review in the public information repositories (listed at the end of this section) or on the [IR Program Website](#).

Community participation is also solicited through public mailings, including newsletters, fact sheets, public notices, and proposed plans, which are designed to broadly disseminate information throughout the local community. Public mailings for HPNS are sent to more than 2,000 groups and individuals that have added their names to the community mailing list, including residents in the local Hunters Point-Bayview community; city, state, and federal officials; regulatory agencies; and other interested groups and individuals. Previous updates and fact sheets have included general program information such as the status of environmental investigations and cleanup activities at each HPNS parcel. In addition, the Navy has held periodic site tours of HPNS to better explain the status and cleanup activities to interested community members.

For Parcel UC-3, a significant effort was made to inform the public of the remedy proposed in the Proposed Plan and selected in this ROD. Prior to making the Proposed Plan available for public review, a public notice of the meeting and availability of documents was placed in the *San Francisco Chronicle* on February 10, 2013. Additional public notices were placed in the February 2013 editions of two publications (the *San Francisco Bayview* and the *Sun-Reporter*) in the local Hunters Point-Bayview community. The Proposed Plan, along with an associated fact sheet, was distributed to recipients on the community mailing list beginning on February 12, 2013. An online advertisement was also placed on the *San Francisco Bayview* website to direct users to the IR Program website, where electronic copies of the Proposed Plan, fact sheets, the Revised RI Report, and the FS Report were made available.

In accordance with CERCLA § 113 and § 117, the Navy provided a public comment period from February 13, 2013, to April 1, 2013, for the proposed remedial action described in the Proposed Plan for Parcel UC-3. A public meeting to present the Proposed Plan was held at the Southeast Community Facility Commission (located at 1800 Oakdale Avenue, San Francisco, California) from 6:00 to 9:00 p.m. on February 28, 2013. At the public meeting, the Navy gave presentations on the conditions at Parcel UC-3, and representatives from the Navy and regulatory agencies were available to answer questions. A [transcript of the public meeting](#) prepared by a court reporter is part of the Administrative Record for this ROD and is available on the CD for this ROD. Responses to spoken comments received during the public meeting and written comments received during the public comment period are included in the Responsiveness Summary in Section 3.0.

Key supporting documents that pertain to Parcel UC-3 and a complete index of all Navy HPNS documents are available at the following information repositories:

San Francisco Main Library
100 Larkin Street
Government Information Center, 5th Floor
San Francisco, California 94102
Phone: (415) 557-4500

HPNS Office Trailer
690 Hudson Street
San Francisco, California 94124

For access to the Administrative Record contact:

Naval Facilities Engineering Command Southwest
Attention: Diane Silva, Command Records Manager
2965 Mole Road, Building 3519
San Diego, California 92136
Phone: (619) 556-1280

For additional information on the IR Program contact:

Mr. Keith Forman
HPNS BRAC Environmental Coordinator
BRAC Program Management Office West
1455 Frazee Road, Suite 900
San Diego, California 92108-4310
Phone: (619) 532-0913
e-mail: keith.s.forman@navy.mil

3.0 Responsiveness Summary

The responsiveness summary is the third component of a ROD. Its purpose is to summarize information about the views of the public and regulatory agencies on the remedial alternatives and general concerns about Parcel UC-3 submitted during the public comment period. The responsiveness summary documents how public comments were integrated into the decision-making process. The participants in the public meeting held on February 28, 2013, included community members and representatives of the Navy, USEPA, DTSC, and RWQCB. Questions and concerns received during the meeting were addressed at the meeting and are documented in the meeting transcript. Responses to comments provided at the meeting and received during the public comment period by the Navy, USEPA, DTSC, or RWQCB are included in the responsiveness summary (Attachment C).

Parcels E and UC-3 were combined in a Proposed Plan and subsequent community meeting. Comments from community members were not specific to either Parcel UC-3 or Parcel E. The responsiveness summary for the Parcel UC-3 ROD will therefore be identical to the responsiveness summary for the Parcel E ROD.

Attachment 3. Responsiveness Summary

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Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by Saul Bloom (Arc Ecology) at the public meeting held on February 28, 2013

Comment No.	Comment	Response
1.	I have four comments, the first of which I'll make right now, which is that we are formally requesting that the Navy, regulators, extend the public comment period for the Proposed Plan to March 31.	After consulting with the HPNS ¹ regulators, the Navy extended the public comment deadline from March 15, 2013, to April 1, 2013.
2.	<p>In 2009, the Regional Water Control Board entered into an order with — amendment with the San Francisco Airport in which it established a research program that Arc Ecology is involved in engineering to establish a wetlands on the property in — on Parcel E midway from the point in between the two zones that the Proposed Plan calls for riprapping or at least doing some additional shore armoring.</p> <p>We look forward to seeing more detail within the final Proposed Plan and the ROD that indicates how the Navy is contemplating making this area accessible for doing that kind of wetlands restoration activity on that site.</p> <p>So, that is something that we'll be going into in further detail in our formal written comments, but I wanted to raise that issue as an oral comment right now for you to consider.</p> <p>And that final point on that is that my understanding, according — based on the settlement of litigation between the City and the Sierra Club and the Audubon Society with regard to the Environmental Impact Report for the site, that is now the preferred alternative use for — that wetlands is now the preferred alternative use consistent with the redevelopment plan for this particular site.</p>	<p>During preparation of the FS Report for Parcel E (ERRG, 2012), the Navy previously responded to Arc Ecology comments regarding the compatibility of the CERCLA remedial alternatives with the CCSF's future redevelopment plans (as guided by the 2010 HPNS Redevelopment Plan [SFRA, 2010b]). The previous responses are briefly summarized in the following paragraphs.</p> <p>The CCSF's EIR (SFRA, 2010a) was prepared pursuant to CEQA, and was the subject of litigation between the CCSF and Sierra Club/Audubon Society. The court-approved settlement agreement between the CCSF and Sierra Club/Audubon Society identified design concepts (including constructed wetlands for stormwater management) for portions of Parcel E that were to be implemented by the CCSF's developer (i.e., Lennar Corporation). CEQA does not apply to the Navy's cleanup decisions under CERCLA, and there is no legal requirement for the Navy to conform to CEQA. Nonetheless, the Navy reviewed the CCSF's EIR and determined that the remedial alternatives presented in the FS Report (which formed the basis of the selected remedy in this ROD) are compatible with the future reuses identified in the 2010 HPNS Redevelopment Plan.</p> <p>The Navy evaluated an appropriate range of shoreline protection technologies and process options in Appendix D of the FS Report. This evaluation concluded that the most viable shoreline protection options for the Parcel E shoreline are armoring (rock revetment) and hybrid stabilization using natural shoreline materials with underlying rock armor. Section 4.2.2.3 of the FS Report identifies a conceptual design for implementing these two options along different sections of the Parcel E shoreline. The conceptual designs presented in the FS Report will be further refined in the RD and will not conflict with CCSF's plans to construct stormwater management systems (including constructed wetlands).</p>

¹ Abbreviations and acronyms are defined at the end of this appendix.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by Saul Bloom (Arc Ecology) at the public meeting held on February 28, 2013 *(continued)*

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| 3. | <p>With regard to liquefaction and community acceptance with regard to the ultimate remedy of the site, we would encourage the Navy to — in its presentation about the engineering for site stabilization and that sort of thing to talk about the impacts of failure in more detail, not just because we are concerned about necessarily failure, but because we think that in co— in discussing the impacts of failure with regard to health risk and that sort of thing will help clarify for the community the relative risk of failure for these remedies.</p> <p>People become confused. When people talk about the site fissuring; when people talk about any of these institutional controls failing, often times we don't talk enough about is what is in fact the ramification of such a failure. And in many cases, what we are finding is that the ramifications of these failures are far less than what people are concerned about.</p> <p>As a result, articulating these assessments will be much more helpful to the community in terms of understanding why a particular remedy is selected and how that remedy will be engineered and what — the ramifications of that remedy's failure. I think those are going to be very, very helpful in terms of translating these decisions back to the community.</p> | <p>The Navy will describe the potential risks associated with liquefaction in the RD and will further evaluate this very important part of the design, including consulting with other technical experts, to make sure that the final cover is built to withstand the appropriate design earthquake and comply with numerous other regulatory requirements.</p> <p>Specifically, the Navy will perform, as part of the RD, a comprehensive static and seismic slope stability evaluation for the covers at Parcel E to ensure that the proposed design can, consistent with the requirements of Title 22 Cal. Code Regs. § 66264.310(a)(5), accommodate the inertial forces generated by the maximum credible earthquake while maintaining the integrity of the cover system. Also, in accordance with the requirements of Title 22 Cal. Code Regs. § 66264.310(b)(1) and (b)(5), the Navy will maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events throughout the post-closure period (which will extend for as long as necessary to protect human health and the environment).</p> |
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Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by Saul Bloom (Arc Ecology) at the public meeting held on February 28, 2013 *(continued)*

4. I would be remiss if I did not mention Proposition P.
- Again, my recommendation to the Navy with regard — and to the regulators with regard to the discussion of Proposition P is to acknowledge Proposition P for what it is, which is the community's concern about the quality of the cleanup at the site.
- And in terms of presentation of why specific remedies and health risks are selected, I would highly recommend that the discussion take place in light of Prop P as a reference point getting what the difficulties are, meeting the criteria of what the relative benefits would be.
- That way, again, as with the liquefaction question, the community would be better able to understand why a particular remedial decision is selected versus the sense that most people get, which is that Prop P is just simply not a topic for discussion among the regulators and the Navy, which I don't believe is in fact the case.
- I understand that everybody is trying hard to figure out how to address the community's selectio— — cleanup criterion. And I think the best way to do that, as a friendly suggestion, would be to talk about it effect — positively and say: It's a recognized concern of the community. Here's why we are doing what we are doing relative to that. And I think that will go a long way to address people's concerns about the selection of remedies for the site.

As described on page 18 of the Proposed Plan, the community acceptance criterion is one of two modifying criteria and has been evaluated based on comments provided in the course of the CERCLA remedy selection process, including those received on the Proposed Plan, and other community input, including Proposition P. Consistent with the NCP [Title 40 CFR § 300.430(e) and (f)], the Navy's evaluation of the community acceptance criterion is documented in this ROD, which includes the subject responsiveness summary. The Navy notes that several engaged residents who live in close proximity to HPNS have agreed with the preferred alternatives published in the Proposed Plan, and their agreement documents community acceptance.

Proposition P was adopted by the CCSF Board of Supervisors in Resolution 634-01 in August 2001. Although Proposition P does express a recommendation from the Hunters Point Bayview community for cleanup to a level allowing unrestricted use of the property, Proposition P also urges the Navy to clean up the shipyard in a manner that does not rely on future owners to maintain barriers to protect the public from exposure unless other remedies are technically infeasible. The Navy, in its FS Report that was concurred upon by the other Federal Facility Agreement signatories, has determined that the selected remedies are the most feasible and effective.

The Navy also notes that Proposition P is a local governmental resolution and is not a federal or state statute or promulgated regulation. Therefore, Proposition P is not a CERCLA federal or state ARAR for purposes of CERCLA remedy selection in Parcel E.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by Raymond Tompkins at the public meeting held on February 28, 2013

Comment No.	Comment	Response
1.	<p>My concern on that in terms of the comment is that, as I've stated in the letter previously when we reviewed E-2 and to the regulators as well for consideration in that matter, that I believe the presumptive remedy is incorrect being utilized here for the remediation work on this particular site of "E."</p> <p>Given the definition and the supporting evidence that I looked at and reviewed, I do not — for the volume, according to RASO and Dr. Lowmax [sic], Laurie Lowmax, who gave a report to the RAB in that her projection of the total volume of soil what was impacted at the E-2 site that it was 23 acres; in some areas it goes to 36 feet deep, and the soil volume is 20 percent of the total volume. I do not see that as municipal waste and that the remedy is inappropriate being used there. I don't see radiation coming out of people's sinks.</p> <p>I think also for consideration on this — on this issue of presumptive remedy, given the type of radiation from the radium dials — and I'm an old baby boomer, and they used to make kids watches with the glow stuff on it and that as a child, yes, it crumbled in my hand. It came off real quick, and that we know the second product is radon gas. Great radon gas as being a gas means that it's mobile. The possibility of this, especially with land use and rise being in the area, this could migrate.</p> <p>And then the third product is polonium, which has a life span — half—life span of 1,600 years being radioactive. That's a long time for the government to be dealing with that.</p> <p>Again, I do not feel that this — and also under the section that talked about being close to tides — thank you — that given all these variables and limitations, that we're scoting — scoting very close to the edge in terms of what the law and it's up to interpretation. I think for human safety, a more rigid and vigorous approach should be used in the analysis and approach in terms of solving this problem.</p>	<p>The Navy wishes to clarify that it has not relied upon the containment presumption in developing or evaluating the remedial alternatives for Parcel E. Further, the Navy wishes to clarify that Parcel E is distinct from the adjoining Parcel E-2. Parcel E is one of six parcels (Parcels A through F) originally designated for environmental restoration. In September 2004, the Navy divided Parcel E into two parcels (Parcels E and E-2) to facilitate closure of the Parcel E-2 Landfill and its adjacent areas. Parcel E-2 was the subject of a separate evaluation process, performed in accordance with CERCLA² and the NCP, that culminated with a signed ROD in November 2012. This ROD addresses Parcel E and is unrelated to the Parcel E-2 Landfill referred to in this comment.</p>

² Abbreviations and acronyms are defined at the end of this appendix.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by Raymond Tompkins at the public meeting held on February 28, 2013

2. I have to concur with Mr. Bloom's statement 100 percent.
- As I was talking to — and then I was told I can't discuss that. But in this point, confirmation, confirmation, confirmation. My criticism was: In the presenting of this evening, there was a lot of assumptions without confirmation, in my view.
- And that in the future studies for those holes, those — in 2000 — no — 1996, I believe, in '93 when those bores were done, I would like to see confirmation for a couple of reasons. Synergistic effect.
- After the fire, what other harmful products can be possibility in that how is that brought up in your plan to address that and to then put the limitation? Because one of the issues when — as Mr. Bloom just talked about, when the systems or whatever we create — we're human beings. There's always a possibility of failure. Then what are the protections safeguard?
- And would the Navy pay for damages from this failure of the site to the community as it affects their impact in health or property under, for example, a serious earthquake? I haven't heard or — in our discussions or presented publicly how will this hold up under an earthquake?
- Since Japan had a 9, the earth is changing. We've had historically a 8.2. We had the echoing effect of the Cypress Freeway, although it was a 7 because of the rever— — re— — I'm not a geologist, but the wavelength being not — what do they call it? — increase because of the bouncing to and forth. This property is susceptible to this under certain conditions. How is that going to be addressed, and how are the safeguards going to be placed over there?
- I haven't seen it or any of the public presentations. You may have it on record, but we haven't heard about it, since it's no longer a RAB or technically to talk about it.
- Could you please in future discuss that to the public and the Navy's responsibility and liability of these. Unfortunately, the times we live in drastic situations, and how would that be respond that would hold down confusion under serious situation?
-

As stated in the response to comment 3 from Mr. Bloom, the Navy will perform, as part of the RD, a comprehensive static and seismic slope stability evaluation for the covers at Parcel E to ensure that the proposed design can, consistent with the requirements of Title 22 Cal. Code Regs. § 66264.310(a)(5), accommodate the inertial forces generated by the maximum credible earthquake while maintaining the integrity of the cover system. Also, in accordance with the requirements of Title 22 Cal. Code Regs. § 66264.310(b)(1) and (b)(5), the Navy will maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events throughout the post-closure period (which will extend for as long as necessary to protect human health and the environment).

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by John Njoroge at the public meeting held on February 28, 2013

Comment No.	Comment	Response
1.	<p>Hi. I'm intending to make some comments about CEQA and the environmental impact of this project as well as the impact it has on other people here in the Bay Area who are churchgoers and people struggling in this community basically.</p> <p>From James, Chapter 5:</p> <p>Look here, you rich men, now is the time to cry and groan with anguished grief because of all the terrible troubles ahead of you.</p> <p>Your wealth is even now rotting away, and your fine clothes are becoming mere moth-eaten rags. The value of your gold and silver is dropping fast, yet it will stand as evidence against you, and eat your flesh like fire. That is what you have stored up for yourselves to receive on that coming day of judgment.</p> <p>For listen! Hear the cries of the field workers whom you have cheated of their pay. Their cries have reached the ears of the Lord of Hosts.</p> <p>You have spent your years here on earth having fun, satisfying your every whim, and now your fat hearts are ready for the slaughter. You have condemned and killed good men who had no power to defend themselves against you.</p> <p>Now as for you, dear brothers who are waiting for the Lord's return, be patient, like a farmer who waits until the autumn for his precious harvest to ripen. Yes, be patient. And take courage, for the coming of the Lord is near.</p> <p>Don't grumble about each other, brothers. You are yourselves above criticism [sic]. For see! The great Judge is coming. He is almost here (let Him do whatever criticizing must be done).</p>	<p>The Navy wishes to clarify that the cleanup decision being made for Parcel E is following a process established by CERCLA³ and the NCP. CEQA does not apply to the Navy's cleanup decisions under CERCLA, and there is no legal requirement for the Navy to conform to CEQA.</p> <p>The Navy has worked with EPA, DTSC, and the Water Board to perform the environmental cleanup work at HPNS in a manner that achieves the environmental justice goals (consistent with Executive Order 12898) of fully protective cleanup actions, fair and equal treatment, and meaningful involvement for all people in the Bayview-Hunters Point community. Our efforts to satisfy these goals include:</p> <ul style="list-style-type: none"> ▪ Substantial regulatory review and oversight of all Navy cleanup activities. The EPA, DTSC, Water Board, CCSF, California Department of Public Health, Bay Area Air Quality Management District, and San Francisco Bay Conservation and Development Commission all have dedicated significant additional staff to HPNS to ensure that the Navy's cleanup work is performed in a way that is protective of the Bayview-Hunters Point community and complies with federal and state laws and regulations. ▪ Substantial financial commitment from the Navy to HPNS cleanup. The Navy has spent approximately \$716 million over the past 20 years on the HPNS cleanup program, and these expenditures have made HPNS one of the nation's largest BRAC cleanup programs. The Navy's cleanup efforts to date have successfully removed, treated, or contained a significant volume of contamination that would otherwise pose an unacceptable risk to site workers and future occupants. ▪ Meaningful community engagement under the Navy's Updated CIP. The Navy updated their CIP in 2011 (and will update the CIP again in summer 2013) to present the communication and community involvement program activities that were designed to meet the specific needs and desires of the HPNS community (Navy, 2011).

³ Abbreviations and acronyms are defined at the end of this appendix.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Spoken Comments by John Njoroge at the public meeting held on February 28, 2013 *(continued)*

Comment No.	Comment	Response
1. (<i>cont.</i>)	(see above)	<ul style="list-style-type: none"> ▪ Employment. The Navy works closely with their existing contractors to emphasize the importance of hiring community members to assist in the cleanup program, and works with interested stakeholders (such as the CCSF) to promote job training programs. These efforts have proven successful based on recent estimates—from 2009 to 2011 over 1,000 community members have been employed under Navy contracts (on either full-time, part-time, or temporary basis) to assist in the cleanup program. In addition, the Navy and their contractors have identified a large network of local businesses to assist in the cleanup program, such as those providing document production services, supplying building materials and consumables (drinking water and ice), renting heavy equipment, and transporting soil and rock. These efforts have proven successful based on recent estimates of over \$11 million worth of goods and services from local businesses. ▪ Commitment to protective cleanup actions. Most importantly, the Navy, EPA, and the State of California regulatory agencies are committed to fully protective cleanup actions at Parcel E and throughout HPNS. The selected remedies for Parcel E will remove significant amounts of contaminants and safely contain the remaining material, and will prevent unacceptable exposure to humans (both future site users and the surrounding community) and wildlife.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Written Comments by Andrea Ibarra-Tacdol received on March 12, 2013 via email

Comment No.	Comment	Response
1.	<p>My name is Andrea Tacdol. I am a mother of two living on Van Dyke Avenue in the Bayview, less than a mile from Parcels E and UC-3 of the Hunters Point Naval Shipyard. One of my biggest concerns is that my family already lives beside an industrial zone where trucks are coming and going on our residential street. Residents of our community and neighborhood are feeling the impacts of the air pollution and excess noise.</p> <p>I believe that the Proposed Plan for clean-up for all parcels must include a requirement that trucks coming and going to the Naval Shipyard do NOT go through residential streets. Not only do the trucks inundate our community with even more diesel pollution that is a major cause of asthma and linked to cancer, but the trucks will also be carrying toxic waste. As you remove and dispose of contaminated soil, remove the oil source at the Former Oily Waste Ponds, remove radiologically contaminated soil, please assure us that the trucks are safely carrying the materials out of our community without chance of spillage and avoiding residential streets.</p> <p>The shipyard must have an agreement with the trucking companies to utilize the SF MTA's advised truck routes. There should be a community hotline to call when we see large trucks passing through our neighborhood and the city should find a way to enforce these rules and address violations quickly. Ultimately, we'd like to see the city move beyond having these truck routes as only advisory.</p>	<p>The Navy and their contractors have established strict protocols for all offsite hauling from HPNS cleanup activities. These protocols have been implemented on numerous past cleanup actions at HPNS and serve to minimize the impact of offsite hauling on the local community. Similar protocols would be implemented for the final cleanup at Parcel E. The procedures for offsite hauling, which are detailed in plans that are subject to regulatory agency review and approval, are summarized below.</p> <p>Dust Control: Dust control is a top priority on all HPNS cleanup projects. All trucks are covered (tarped) and their exterior areas (most notably the fenders and tires) are cleaned prior to leaving the cleanup site. While driving on paved roads within HPNS property, all trucks adhere to a speed limit of 15 miles per hour. In addition, water is applied to the onsite roads during hauling operations. These onsite actions serve to minimize dust emissions once the trucks leave HPNS property.</p> <p>Additional Controls for Contaminated Waste: All contaminated material is properly characterized prior to offsite disposal, and all offsite disposal is performed in accordance with pertinent federal and state requirements. For example, the U.S. Department of Transportation Hazardous Material Transportation regulations require the proper packaging, labeling, and tracking of hazardous wastes while being transported to a licensed disposal facility.</p> <p>Truck Hauling Route: The Navy has a qualification process for all truck drivers to ensure that they are properly licensed, and that they fully understand and will adhere to the HPNS protocols for offsite hauling. This qualification process includes a requirement to follow a prescribed hauling route from the HPNS main gate to either Highway 101 or Interstate 280:</p> <ul style="list-style-type: none"> ▪ Trucks exit the HPNS main gate and turn right on Innes Avenue. ▪ Trucks bear right at the fenced vacant lot as Innes Avenue becomes Hunters Point Boulevard (which again changes to Evans Avenue at the former Pacific Gas & Electric power plant). ▪ Trucks follow Evans Avenue across Third Street to Cesar Chavez. <p>The qualification process, which would be implemented for the final cleanup at Parcel E, includes obtaining each truck driver's signature acknowledging their understanding and acceptance of all protocols for offsite hauling.</p>

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Written Comments by Christopher Mooney received on March 14, 2013 via e-mail

Comment No.	Comment	Response
1.	I write in support of the Navy's proposed plan for cleanup of HPNS Parcels E and UC-3. The February 2013 written proposal provides detailed explanations of cleanup alternatives and adequately considers the cost-to-benefit impacts of each alternative. I agree with the Navy's proposed solutions and hope the cleanup proceeds expeditiously.	Thank you for your comment.

Written Comments by Philip Ragozziano received on March 18, 2013 via mail

Comment No.	Comment	Response
1.	After having read and considered the alternatives, I support the conclusion on page 18 of the pamphlet "Hunters Point Naval Shipyard – Parcels E and UC-3." I have been a resident of the neighborhood outside the shipyard for more than twenty years, have had the opportunity on occasion to tour the shipyard, and thought no clean-up would ever occur. I would rather see the remediation, even if not to the ultimate degree, than nothing done. So please move on with the process right away. Do what's most expedient and will both clean and contain the toxic elements and which can be paid for. Thanks for the opportunity to be heard. Keep me informed with your mailings.	Thank you for your comment.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Written Comments by Jaron Browne (POWER⁴) and Marie Harrison (Greenaction) received on April 1, 2013 via e-mail

Comment No.	Comment	Response
1.	<p>POWER and Greenaction are submitting the following comments on the Proposed Plan for Parcels E and UC3, with support and consultation from environmental scientist Wilma Subra. There are two core areas of concern where we differ with the Navy's recommendations in the Proposed Plan:</p> <ul style="list-style-type: none"> First, in relation to remediation of residual radiological contamination in the proposed plan, we strongly urge the Navy to use the 3-foot thick soil cover that was proposed in remedy R-3, rather than the 2-foot soil cover. Second, in relation to the former oily waste ponds, we strongly urge the Navy to pursue Alternative O-6, because of how much information is still needed to understand the level of contamination. Alternative O-6 is the most comprehensive remedy for minimizing risk for the community. 	Please refer to the responses to comments 2 and 3 below.
2.	<p>Residual Radiological Contamination</p> <p>The preferred alternative R-2 is an appropriate remedy. However, R-3 proposes a 3-foot thick soil cover versus a 2-foot thick soil cover proposed in R-2 and would be more protective. The R-3, 3-foot thick soil cover would provide an added depth of cover material. However, the Navy states the 2-foot thick soil cover is easier to carry out. <i>We strongly urge that the Navy adhere to the precautionary principle and apply the 3-foot cover in order to best protect the health of residents.</i></p>	<p>As described on pages 17 and 18 of the Proposed Plan (and illustrated in Table 15), Alternatives R-2 and R-3 are both protective of human health and the environment and are equally effective in the long-term. The Navy reached this conclusion based on an evaluation performed in the Radiological Addendum to the FS Report for Parcel E (ERRG and RSRS, 2012). The Navy's evaluation, which was reviewed and accepted by the EPA, DTSC, and Water Board, includes risk modeling that demonstrates the 2-foot-thick soil cover, combined with institutional controls and long-term inspection and maintenance, would prevent unacceptable exposure to people. The information presented in the Proposed Plan, as supported by the Radiological Addendum to the FS Report, demonstrates that the 3-foot-thick cover is not more effective but would be more difficult to carry out. Accordingly, the Navy has selected Alternative R-2 to address residual radiological contamination at Parcel E because it complies with the two threshold criteria, and provides the best balance of tradeoffs with respect to the five balancing criteria specified in the NCP. The Navy's evaluation of the two modifying criteria did not warrant changes to the preferred alternative for residual radiological contamination at Parcel E.</p>

⁴ Abbreviations and acronyms are defined at the end of this appendix.

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Written Comments by Jaron Browne (POWER) and Marie Harrison (Greenaction) received on April 1, 2013 via e-mail (continued)

Comment No.	Comment	Response
2. (cont.)	(see above)	<p>The State of California, through DTSC and the Water Board, and several engaged residents who live in close proximity to HPNS have agreed with the preferred alternative published in the Proposed Plan. The information presented by members of the community that disagree with the preferred alternative does not justify modification of the preferred alternative based upon the “community acceptance” criteria of the NCP. The preferred alternative will remove significant amounts of radiological contamination, safely contain the remaining contamination, and will prevent unacceptable exposure to humans (both future site users and the surrounding community) and wildlife.</p> <p>The Navy wishes to clarify that the precautionary principle, incorporated as a policy statement in Chapter 1 of the San Francisco Environment Code, is a local governmental policy and is not a federal or state statute or promulgated regulation. Therefore, the precautionary principle is not a CERCLA federal or state ARAR for purposes of the CERCLA remedy selection for Parcel E. In addition, the precautionary principle policy statement, as reflected in Chapter 1 of the San Francisco Environment Code, contains no substantive provisions that would pertain to evaluation and selection of a CERCLA remedial action. The Navy believes that the nine NCP evaluation criteria, which were used to evaluate each remedial alternative for Parcel E, adequately capture the elements described in the CCSF’s policy statement.</p>
3.	<p>Former Oily Waste Ponds</p> <p>The Navy’s preferred alternative for the former oily waste ponds consist of O-4. The remedy consists of removal of contaminated oil or in-situ treatment, a soil cover, liner and below ground barrier and active groundwater treatment. This alternative leaves much information to be determined before the actual remedy is selected. Alternative O-5 consists of removal of all contaminated oil above the groundwater. Alternative O-6 consists of the removal of all contaminated oil above and below the groundwater. <i>We strongly urge the Navy to pursue Alternative O-6 because it will result in the removal of all the contaminated oil. The contaminated oil in the former oily waste ponds is a principal threat waste in Parcel E.</i></p>	<p>As described on page 18 of the Proposed Plan, the Navy’s evaluation identified major differences between Alternative O-6 and Alternatives O-2, O-3, and O-4 relative to short-term effectiveness, implementability, and cost. In comparison with Alternatives O-2, O-3, and O-4, Alternative O-6 presents more short-term risks (for example, increased risk of accidents for site workers), would be more difficult to carry out, and would cost more. The ratings for Alternative O-6 were based on several factors, the most significant being the deep excavation (potentially up to 35 feet) required to completely remove the contaminated oil. Alternatives O-2, O-3, and O-4 present fewer short-term risks, would be easier to carry out, and would cost significantly less in comparison with Alternative O-6.</p>

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Written Comments by Jaron Browne (POWER) and Marie Harrison (Greenaction) received on April 1, 2013 via e-mail *(continued)*

Comment No.	Comment	Response
3. <i>(cont.)</i> <i>(see above)</i>		<p>Alternative O-2 would be the easiest and least expensive because it involves only containment, while Alternatives O-3 and O-4 balance ease of implementation and cost because they would involve removing or treating the contaminated oil without major excavations.</p> <p>Accordingly, the Navy has selected Alternative O-4 to address the contaminated oil source at Parcel E because it complies with the two threshold criteria and provides the best balance of tradeoffs with respect to the five balancing criteria specified in the NCP. The Navy's evaluation of the two modifying criteria did not warrant changes to the preferred alternative for residual radiological contamination at Parcel E. The State of California, through DTSC and the Water Board, and several engaged residents who live in close proximity to HPNS have agreed with the preferred alternative published in the Proposed Plan. The information presented by members of the community that disagree with the preferred alternative does not justify modification of the preferred alternative based upon the "community acceptance" criteria of the NCP. The preferred alternative will either remove or treat the contaminated oil source and will safely contain the residual contamination in a manner that prevents unacceptable exposure to humans (both future site users and the surrounding community) and wildlife.</p> <p>Although the complex site conditions at the Former Oily Waste Ponds result in some uncertainty regarding the effectiveness and implementability of certain remediation technologies, the Navy, with the support of EPA, DTSC, and the Water Board, believes that there is adequate information to select a remedy for the contaminated oil source. Further, the Navy believes that Alternative O-4 incorporates a broad range of removal and treatment technologies that could be used in combination to cost-effectively achieve the RAOs. As described on page 26 of the Proposed Plan, the Navy will perform additional studies to select the best combination of technologies to remove or treat the contaminated oil source at the Former Oily Waste Ponds. The Navy has begun developing the approach for these additional studies in consultation with EPA, DTSC, and the Water Board. A field study is planned for later in 2013 and is expected to help refine the cleanup approach at the Former Oily Waste Ponds in support of the RD.</p>

Proposed Plan for Parcel E, Hunters Point Naval Shipyard (HPNS), San Francisco, California

Written Comments by Jaron Browne (POWER) and Marie Harrison (Greenaction) received on April 1, 2013 via e-mail *(continued)*

Comment No.	Comment	Response
4.	<p>In review of the soil and shoreline sentiment and groundwater contamination, we are aligned with the preferred alternatives recommended by the Navy.</p> <p>Soil and Shoreline Sediment</p> <p>Alternative S-4 is the most robust and protective of the alternatives proposed for contaminants in soil and shoreline sediments. Alternative S-4 is the only alternative that will result in excavation and off site disposal of contaminated soil from Tier 2 and Total Petroleum Hydrocarbon locations. Tier 2 locations contain chemicals at concentrations greater than five times the preliminary remedial goal. Total petroleum hydrocarbons locations exceed the preliminary remedial goal. Alternative S-4 is the only alternative that will address VOC contamination associated with the building 406 TCE plume using soil vapor extraction.</p>	Thank you for your comment.
5.	<p>Groundwater Contamination</p> <p>Alternative GW-3 and GW-4 are the most protective alternatives proposed for groundwater contamination. The two alternatives consist of active groundwater treatment for VOC plumes under parcels E and UC-3. Alternative GW-3 consists of either biological nutrients or zero valent iron treatment while alternative GW-4 consists of air sparging for the building 406 TCE plume. The Navy selected GW-3 as the preferred alternative remedy. That alternative, as well as GW-4, will treat the groundwater contaminants appropriately.</p>	Thank you for your comment.
6.	<p>We urge the Navy to reconsider the preferred plans for the residual radiological contamination and select a 3-foot soil cover, and select alternative O-6 the former oily waste ponds based on the need to minimize risk and provide the highest level of protection of the health of residents in the community.</p>	Please refer to the responses to comments 2 and 3 above.
